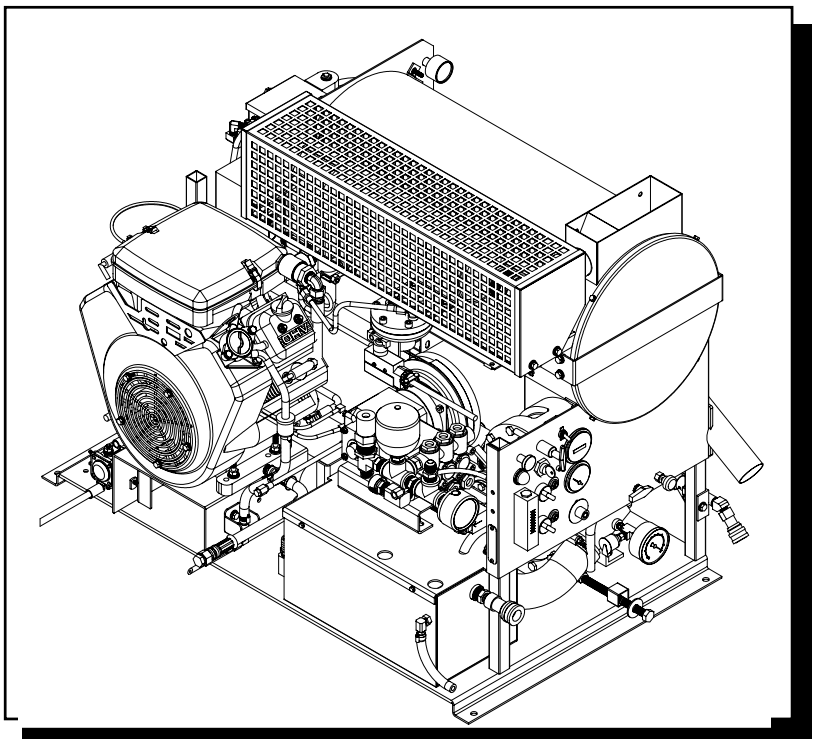
PROCHEM
OIL FIRED
TRUCK MOUNT

Mobile Cleaning Unit



Operating Instructions (ENG)

MODELS: OFTM

Read instructions before operating the machine.

H 980076
04/11/06

MODEL _____

DATE OF PURCHASE _____

SERIAL NUMBER _____

SALES REPRESENTATIVE # _____

YOUR DEALER

NAME: _____

ADDRESS: _____

PHONE NUMBER: _____

Welcome…and congratulations on your purchase of the **PROCHEM** Mobile Cleaning Unit. This instruction manual is a guide for operating and servicing your PROCHEM unit. **Read this manual completely before installing or operating this unit.**

This unit offers you personal convenience. All of your instrumentation and controls have been positioned to give you easy access for operation and daily maintenance. Proper operation and service are essential to the efficient functioning of this unit. When maintained correctly, this unit will have a long, trouble-free life.

The service methods described in this manual are explained in such a manner that servicing may be performed accurately and safely. Proper service varies with the choice of procedure, the skill of the mechanic, and the tools or parts available. Before attempting any repair, make certain that you are thoroughly familiar with this equipment and are equipped with the proper tools. Any questions pertaining to operating or servicing this unit should be directed to your nearest PROCHEM dealer and/or service center.

THIS UNIT MUST BE INSTALLED BY THE DEALER FROM WHOM YOU PURCHASED IT, IN ACCORDANCE WITH PRESCRIBED PROCHEM INSTALLATION PROCEDURES.

MAKE CERTAIN THAT THE WARRANTY CARD IS FILLED OUT BY THE DEALER FROM WHOM YOU PURCHASED THIS UNIT AND RETURNED TO PROCHEM!

This operation and service manual is written specifically for the **PROCHEM** Mobile Cleaning Units, which are manufactured by:

PROFESSIONAL CHEMICALS CORPORATION
325 SOUTH PRICE ROAD
CHANDLER, ARIZONA 85224

Information in this document is subject to change without notice and does not represent a commitment on the part of Professional Chemicals Corporation.

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RECEIVING YOUR UNIT

ACCEPTANCE OF SHIPMENT

Every part of your Oil Fired Truck mount cleaning unit was carefully checked, tested, and inspected before it left our manufacturing plant. **Upon receiving the unit, make the following acceptance check:**

1. The unit should not show any outward signs of damage. If damaged, notify the common carrier immediately.

2. Check your equipment and packing list. The standard Oil Fired Truck mount cleaning unit should arrive equipped with the following items (unless otherwise specified) and any optional accessories which were ordered:

EQUIPMENT LIST

1. **Oil Fired Truck mount console.**
2. **Operation and service manual with engine, water pump, and vacuum pump manuals.**
3. **Installation bolting kit.**
4. **Installation mounting plates.**
5. **Hose clamps for vacuum hoses.**
6. **Carpet wand.**
7. **Waste tank w/float switch.**
8. **Waste tank filter and strainer basket.**
9. **100 ft. of 2” vacuum hose.**
10. **1 vacuum hose connector.**
11. **100 ft. of 1/4" high pressure hose with quick connects.**
12. **50 ft. water supply hose with quick connect.**
13. **Stack outlet adapter**

OPTIONAL EQUIPMENT

14. **Winterizing loop hose. Part #10-805380.**
15. **Upholstery tool and stair tool.**
    #78513
    #78519 (LONG)
    #78521 (SHORT)
18. **Extra wands.**
19. **Hose reel. #65-950393**
20. **Extra vacuum hoses. Part #10-805060.**
21. **Extra vacuum hose connectors. Part #12-800078.**
22. **Extra high pressure water hoses. Part #10-805122.**
23. **Van storage unit. Part #65-950392.**
24. **Dual auxiliary water tanks with demand pump. Part #66-945260.**
25. **Automatic waste pump kit. Part #66-945533**
26. **Galvanized drip tray. Part #56-501845**
27. **Water softener. Part #66-945430.**

This manual contains the following sections:

- HOW TO USE THIS MANUAL
- SAFETY
- OPERATIONS
- MAINTENANCE
- PARTS LIST

The HOW TO USE THIS MANUAL section will tell you how to find important information for ordering correct repair parts.

Parts may be ordered from authorized dealers. When placing an order for parts, the machine model and machine serial number are important. Refer to the MACHINE DATA box which is filled out during the installation of your machine. The MACHINE DATA box is located on the inside of the front cover of this manual.

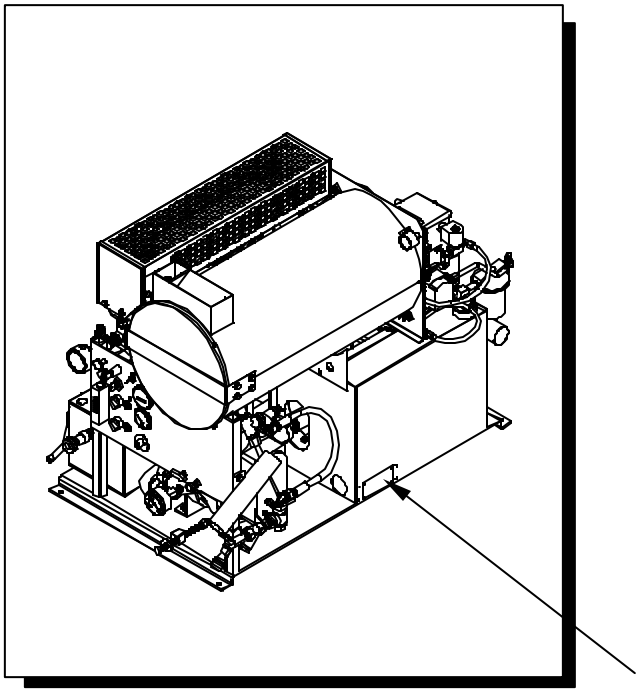
MODEL _____

DATE OF PURCHASE _____

SERIAL NUMBER _____

SALES REPRESENTATIVE # _____

The model and serial number of your machine is on the lower front panel of the machine.



The SAFETY section contains important information regarding hazard or unsafe practices of the machine. Levels of hazards is identified that could result in product or personal injury, or severe injury resulting in death.

The OPERATIONS section is to familiarize the operator with the operation and function of the machine.

The MAINTENANCE section contains preventive maintenance to keep the machine and its components in good working condition. They are listed in this general order:

- Engine
- Vacuum Pump
- Drive Belts, Pulleys & Hubs
- Chemical Pumps
- Hoses
- Fuel Burner
- General Service Adjustments
- Troubleshooting

The PARTS LIST section contains assembled parts illustrations and corresponding parts list. The parts lists include a number of columns of information:

- **REF –** column refers to the reference number on the parts illustration.
- **PART NO.** – column lists the part number for the part.
- **DESCRIPTION** – column is a brief description of the part.
- **SERIAL NO. FROM** – column indicates the first machine the part number is applicable to. When the machine design has changed, this column will indicate serial number of applicable machine. The main illustration shows the most current design of the machine. The boxed illustrations show older designs. If column has an asterisk (*), call manufacturer for serial number.
- **NOTES** – column for information not noted by the other columns.

NOTE: If a service or option kit is installed on your machine, be sure to keep the KIT INSTRUCTIONS which came with the kit. It contains replacement parts numbers needed for ordering future parts.

IMPORTANT SAFETY INSTRUCTIONS

When using this machine, basic precaution must always be followed, including the following:

READ ALL INSTRUCTIONS BEFORE USING THIS MACHINE.

⚠ WARNING:
⚠ CAUTION:

These symbols mean WARNING or CAUTION. Failure to follow warnings and cautions could result in fatality, personal injury to yourself and/or others, or property damage. Follow these instructions carefully!

Read the operator's manual before installing or starting this unit. Failure to adhere to instructions could result in severe personal injury or could be fatal.

Always install the stack outlet adapter on the stack outlet to exhaust the engine and combustion gases upward, when operating this unit.

Operate this unit and equipment only in a well-ventilated area. Exhaust fumes contain carbon monoxide which is an odorless and deadly poison that can cause severe injury or fatality. **DO NOT** run this unit in an enclosed area. **DO NOT** operate this unit where the exhaust may enter any building doorway, window, vent, or opening of any type.

Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well-ventilated, unoccupied buildings away from sparks or flames. Never carry any gasoline or flammable material in the vehicle. Fumes may accumulate inside the vehicle and ignite, causing an explosion. **DO NOT** store any type of flammable material in the vehicle.

This unit must be operated with the vehicle or trailer doors open in order to ensure adequate engine ventilation.

DO NOT operate engine if gasoline is spilled. Avoid creating any ignition until the gasoline has been cleaned up. Never use gasoline as a cleaning agent.

DO NOT place hands, feet, hair, or clothing near rotating or moving parts. Avoid any contact with moving parts! Rotating machinery can cause injury or fatality.

Never operate this unit without belt guards. The high speed moving parts, such as belts and pulleys, should be avoided while this unit is running. Severe injury, damage, or fatality may result.

DO NOT service this unit while it is running. The high-speed mechanical parts as well as high temperature components may result in severe injury or severed limbs.

Never touch electrical wires or components while the engine is running. They can be sources of electrical shock.

Engine components can get extremely hot from operation. To prevent severe burns, **DO NOT** touch these areas while the engine is running or immediately after the engine is turned off.

Before servicing this unit, allow it to "cool down." This will prevent burns from occurring.

Water under high pressure at high temperature can cause burns, severe personal injury, or fatality. Shut down machine, allow to cool down, and relieve system of all pressure before removing valves, caps, plugs, fittings, filters, and bolts.

DO NOT leave the vehicle engine running while operating this unit.

Dangerous Acid, Explosive Gases! Batteries contain sulfuric acid. To prevent acid burns, avoid contact with skin, eyes and clothing. Batteries produce explosive hydrogen gas while being charged. To prevent a fire or explosion, charge batteries only in well ventilated areas. Keep sparks, open flames, and other sources of ignition away from the battery at all times. Keep batteries out of the reach of children. Remove all jewelry when servicing.

Before disconnecting the negative (-) ground cable, make sure all switches are OFF. If ON, a spark will occur at the ground cable terminal which could cause an explosion if hydrogen gas or gasoline vapors are present. When disconnecting the battery, ALWAYS disconnect the negative (-) terminal FIRST.

DO NOT smoke around the unit. Gas fumes may accumulate and be ignited. The battery is also extremely flammable. This will prevent possible explosions.

DO NOT damage the vehicle in any manner during installation. When routing fuel lines **DO NOT** place the hose in any location where damage may occur to the hose or vehicle. Avoid contact with moving parts, areas of high temperature, brake lines, fuel lines, muffler, catalytic converter, or sharp objects.

DO NOT cut or splice any of the vehicle fuel lines during fuel line installation. This may result in fuel leaks and potentially dangerous conditions. There is no fuel solenoid shut off on this unit. Use only the provided abrasion resistant fuel hose for fuel lines. When traversing the vehicle floor with fuel lines, always use a bulkhead adapter. This will prevent leakage and ensure that the hose is not punctured by vehicle vibration abrasion.

DO NOT exceed your vehicle's weight limit. The console with waste tank and accessories weighs approximately 741 lbs. Make certain that the vehicle has the correct axle rating. This will prevent unsafe vehicle driving conditions.

We require high-back seats on all vehicles in which units are to be installed for head and neck protection. We recommend using a metal partition between the seats and equipment.

Keep your vehicle work area clean. Wands, stair tools, and other accessories must be securely fastened before driving the vehicle.

All high pressure hoses must be rated for 3000 PSI at 250°F. Thermoplastic hoses do not meet these specifications and should not be used. Severe burns and injury may result if the hoses do not meet these requirements.

The winterizing loop hose assembly, Part #10-805380, is for winterizing use only. If used improperly, live steam may escape from this hose, causing it to whip around. Burns or injury may result.

Make certain that you receive complete training by the distributor from whom you purchased this unit.

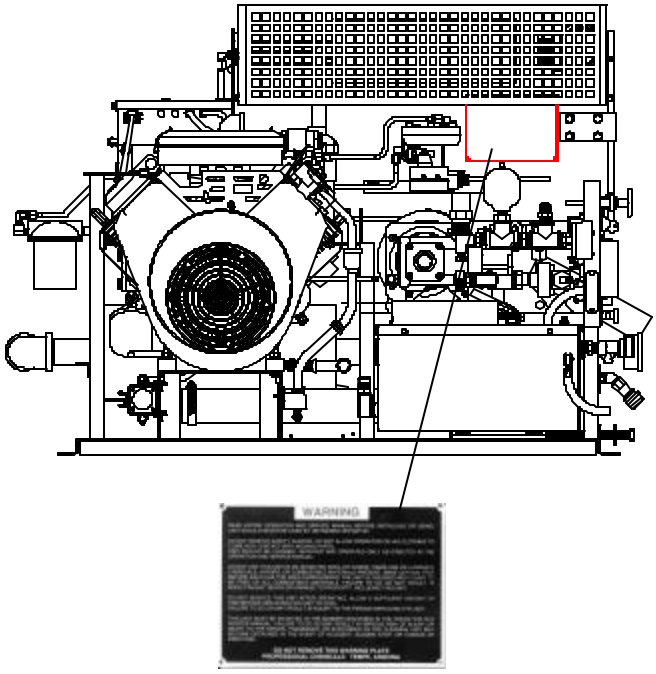
This unit uses high pressure and temperature. Improper or irresponsible use may result in serious injury.

Do not modify this unit in any manner. Improper modification can cause severe personal injury or fatality.

CALIFORNIA PROPOSITION 65 WARNING: Engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

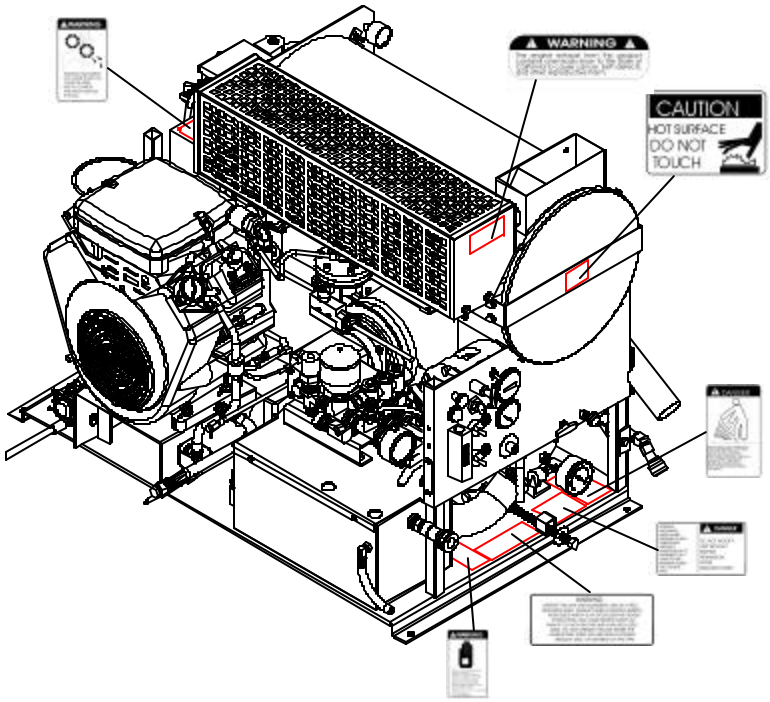
HAZARD INTENSITY LEVEL

*The following **WARNING LABELS** are found on your truck mount console. These labels point out important **Warnings** and **Cautions** which should be followed at **all** times. Failure to follow warnings and cautions could result in fatality, personal injury to yourself and/or others, or property damage. Follow these instructions carefully! **DO NOT** remove these labels.*

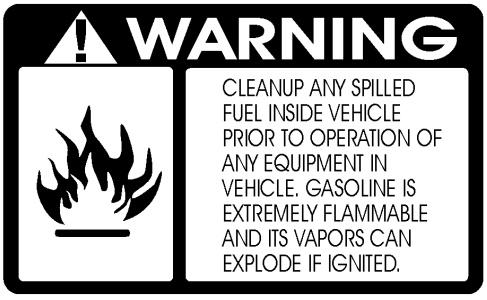


WARNING PLATE
#48-941059

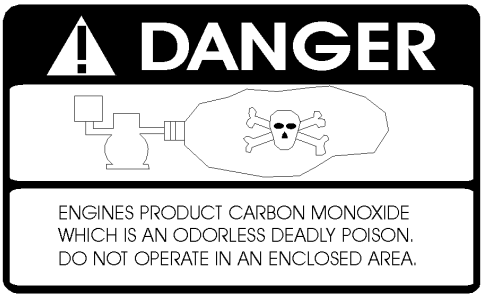
Order Part #48-941212 to get a complete set of decals shown below.



The following decals must be placed in a prominent spot on the vehicle where access is given to operate the unit.


WARNING
CLEANUP ANY SPILLED FUEL INSIDE VEHICLE PRIOR TO OPERATION OF ANY EQUIPMENT IN VEHICLE. GASOLINE IS EXTREMELY FLAMMABLE AND ITS VAPORS CAN EXPLODE IF IGNITED.

Decal, Fuel Clean-Up
Part #48-941317



Decal, Carbon Monoxide
Part #48-941316

ITEM	DIMENSION/CAPACITY
Engine speed	2800 rpm (full throttle)
Water pump rpm	1442 rpm
Vacuum pump rpm	3150 rpm
Water flow rate	3.0 GPM (maximum)
Water pump pressure	1000 PSI (maximum)
Vacuum relief valve	14" Hg
Waste tank capacity	55 Gallons
Console weight	557 lbs.
Console weight (with waste tank & accessories)	741 lbs.
TORQUE VALUES	
Engine hub	264 inch/lbs 22 foot/lbs
Vacuum pump hub	192 inch/lbs 16 foot/lbs

JET SIZING:

Recommended **floor tool** tip sizing not exceed a total of ".045". Using larger jet sizes on your unit may reduce cleaning temperatures.

Example: **Tri-jet wand uses three 95015 jets** (95° spray angle w/ 015 orifice).
015 X 3 = 45

When using two floor tools while cleaning with this unit, it is recommended that each tool tip size does not exceed a total of ".045".

Example: **Tri-jet wand uses three 95015 jets** (95° spray angle w/ 015 orifice).
015 x 3 = 045

Upholstery tool jet size: **80015**
Stair tool jet size: **9502**

INSTALLATION REQUIREMENTS

Prior to starting the installation, first read the **ENTIRE** "Installation" section of this manual. Since the cleaning unit (with waste tank and accessories) weighs approximately 741 pounds, consider the following recommendations before installing this unit.

1. The unit should **NOT** be mounted in any motor vehicle of less than **1/2 ton capacity,** or **3/4 ton** if equipped with one or more auxiliary fresh water tanks.

⚠ CAUTION: The console with waste tank and accessories must NOT exceed the vehicle's axle weight limit.

2. If mounting in a trailer, make certain that the trailer is rated for the total weight of the **UNIT AND TRAILER**. Electric or hydraulic brakes should be provided, and a strict compliance with any State and Federal vehicle laws must be maintained.

3. The vehicle tires should have a load rating above the combined vehicle and unit weight.

4. We do not recommend using flooring materials that absorb water. This could result in rust and corrosion of the vehicle floor.

5. Padding under rubber floor mats should be removed before installing this unit.

6. We highly recommend using a galvanized drip tray under the console (Part #56-501845).

7. If using a trailer, the console should be positioned so that it balances properly with respect to the axle. Ten percent (10%) of the overall unit weight (without accessories or water) should be on the tongue.

   Example: If loaded trailer weight is 2,000 lbs., tongue weight needs to be a minimum of 200 lbs. to tow properly.

FUEL REQUIREMENTS

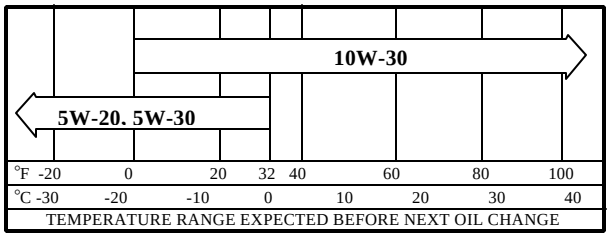
Use unleaded gasoline ONLY. DO NOT use any gasoline additives. We recommend the use of clean, fresh, unleaded gasoline intended for automotive use. High octane gasoline should **NOT** be used with the engine on this unit.

ENGINE OIL REQUIREMENTS

Use high quality detergent oil of at least API (American Petroleum Institute) service class SJ or SH. Select the viscosity based on the air temperature at the time of operation as shown in the following table.

NOTE: Using less than service class SJ or SH oil or extending oil change intervals longer than recommended can cause engine damage.

RECOMMENDED SAE VISCOSITY GRADE



CHEMICAL REQUIREMENTS

The oil fired unit, due to its chemical injection pump design, can be used with a variety of water-diluted chemical compounds (either acidic or alkaline), depending on the job to be done. For information on using the cleaning compounds, contact your distributor.

WATER REQUIREMENTS

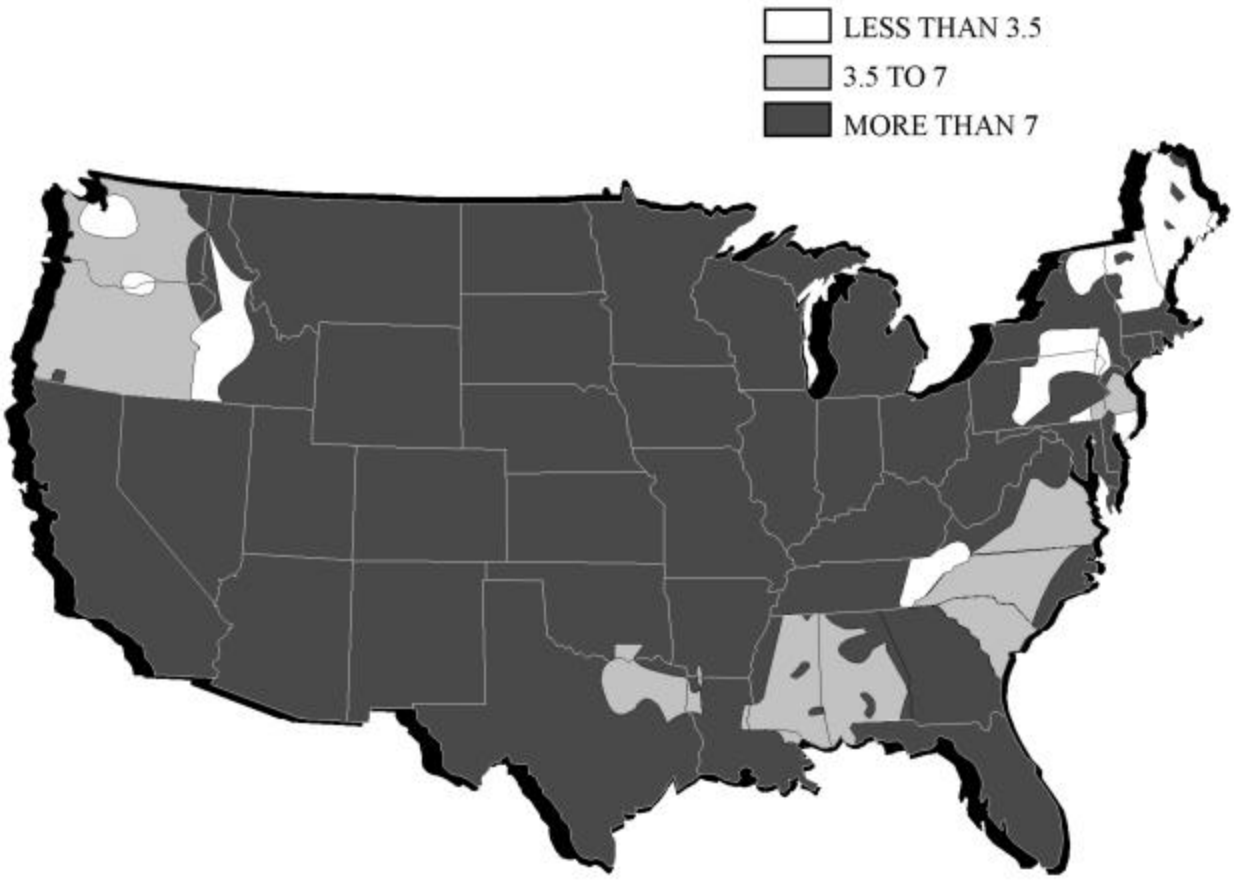
Hard water deposits will adversely affect the plumbing on this unit. The map on the following page, will give you an idea of where areas of high water hardness may occur. However, any water supply obtained from a well is almost always hard water and a water softener will be needed to protect your equipment.

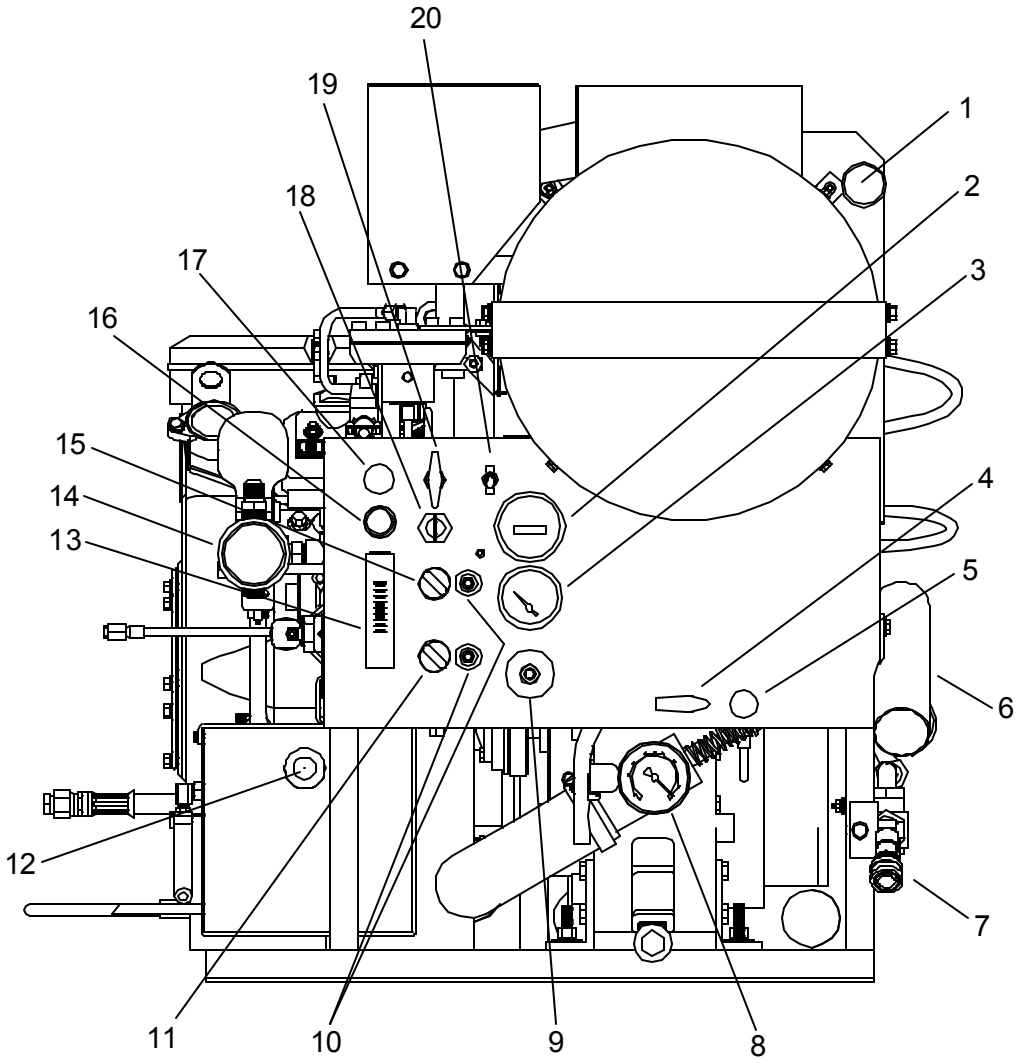
NOTE: Equipment malfunction or component failure caused by hard water scaling is NOT covered under the warranty.

If you are operating this unit in an area where the unit will be using water in which the hardness exceeds 3-1/2 grains, we highly recommend a suitable water softener be installed. If using a water softener, it must have a five (5) GPM (or greater) flow capacity without any hose constrictions.

Using a water softener will reduce maintenance and decrease down time caused by hard water scaling. It will also allow cleaning chemicals to be more effective in lower concentrations.

If you require a water softener, please contact your nearest distributor for information, price, and availability.





1. FUEL PRESSURE GAUGE

The fuel pressure gauge indicates fuel oil pressure to burner.

2. HOUR METER

The hour meter records the number of hours the unit has run. This serves as a time recorder for servicing the machine.

3. TEMPERATURE GAUGE

This valve enables additional heat exchangers to contribute more heat to the system if necessary. By rotating the lever to the right it adds more heat, by rotating to the left it removes heat.

4. CHEMICAL SELECTOR VALVE

This valve allows the chemical to circulate through the chemical system with little or no restriction for priming of system. It also purges out air that may be trapped in the lines and cavities of the chemical system. By turning clockwise the injection system is enabled.

5. CHEMICAL METERING VALVE

The chemical metering valve regulates the amount of chemical that is injected into the system. Clockwise rotation of the knob closes the valve. Counter clockwise rotation opens the valve, allowing more chemical to enter the system.

6. VACUUM INLET

The vacuum inlets serve as connecting point for vacuum hoses.

7. SOLUTION INLET

The solution inlet is the attachment point for clean water to the unit.

8. VACUUM GAUGE

This gauge indicates in inches of mercury how much vacuum the system is producing at any given time.

9. TEMPERATURE CONTROL

This valve enables additional heat exchangers to contribute more heat to the system if necessary. By rotating the lever to the right it adds more heat, by rotating to the left it removes heat.

10. CIRCUIT BREAKER

These serve to protect the circuits from electrical spike and over loads and protects wires from damage and fire.

11. WASTE PUMP OUT AND AUXILIARY WATER PUMP SWITCH

This four-position switch is for activating the waste pumpout device. It also serves to activate the fresh water transfer pump. For turning on pumps, rotate clockwise. For turning off pumps, rotate counter clockwise.

12. WATER INLET

This quick connect allows the water supply hose to be connected to the unit.

13. FLOW METER

The flow meter is a gauge to indicate how much liquid chemical is being introduced in the water system. The quantity can be increased by turning the chemical flow knob counter clockwise.

14. PRESSURE GAUGE

This pressure regulating valve allows the low pressure circuit to be adjusted by turning the handle clockwise the pressure will increase, by turning counter clockwise the pressure will decrease.

15. SOLUTION PUMP SWITCH

This switch serves to energize the magnetic clutch to turn the water pump on or off. Turn clockwise for activating the pump and counter clockwise for deactivating the pump.

16. WASTE TANK FULL INDICATOR LIGHT

This indicator light is activated when the waste tank is full. When lit the unit will shutdown protecting the equipment from damage. This also indicates that the waste tank must be emptied before the unit can be brought back in service.

17. CHOKE CABLE

The choke cable is for restricting air to the carburetor, this enriches the fuel mixture. The primary purpose is for starting in cold temperatures. When the cable is pulled out air is restricted, when pushed in the engine is in run position.

18. KEY SWITCH

The key switch controls the power for the machine. To turn the machine on, rotate the key clockwise until the starter engages the engine. When machine is running let off the switch and engine will continue to run. To turn power off, rotate key counter clockwise to stop position, engine will then stop.

19. THROTTLE CABLE

This serves to set the speed of the engine by pushing the throttle lever in, it serves to increase the speed and letting it out has the effect of slowing down the engine. The lever has notches cut into it, which serves to lock in given speeds. The first notch is calibrated for 1250 rpm. The second notch is calibrated for 1900 rpm and the third notch is calibrated for 2400 rpm.

20. BURNER SWITCH (EMERGENCY OFF)

This switch opens and closes the burner solenoid, thus controlling the flow of fuel to the burner.

WASTE TANK TO CONSOLE CONNECTION

NOTE: Before connecting any hoses to the waste tanks, make certain the hose clamps are on each hose.

1. See Figure 11. Connect the 12” long section of 2” I.D. internal vac hose to the 2” dia. vac inlet tube on the console and the 2” dia. inlet tube on the waste tank. Tighten the hose clamps.

2. Connect the 25” long section of 2-7/8" I.D. internal vac hose to the 2-7/8” dia. vac outlet tube on the waste tank and to the vacuum pump relief valve on the console. It may be necessary to cut this hose to fit. Tighten the hose clamps.

3. Connect the 2” I.D. waste removal hose to the 2” dia. tube at the bottom of the waste tank. Tighten the hose clamps.

4. Connect the 5/16" I.D. water box hose to the barb fitting (pointed downward) on the waste tank, which is mounted on the outside of the waste tank. Tighten the hose clamps.

5. Connect the console engine shut-off cord to the waste tank level sensor cord.

BATTERY CONNECTION

⚠WARNING: Dangerous Acid, Explosive Gases!

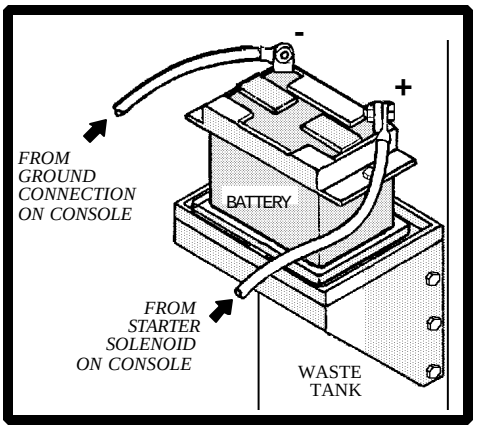
Batteries contain sulfuric acid. To prevent acid burns, avoid contact with skin, eyes, and clothing. Batteries produce explosive hydrogen gas while being charged. To prevent a fire or explosion, charge batteries only in well-ventilated areas. Keep sparks, open flames, and other sources of ignition away from the battery at all times. Keep batteries out of the reach of children. Remove all jewelry when servicing batteries.

Before disconnecting the negative (-) ground cable, make sure all switches are OFF. If ON, a spark will occur at the ground cable terminal which could cause an explosion if hydrogen gas or gasoline vapors are present. When disconnecting the battery, ALWAYS disconnect the negative (-) terminal FIRST.

1. Attach the red positive (+) battery cable from the console starter solenoid to the positive (+) terminal on the battery and tighten the holding nut.

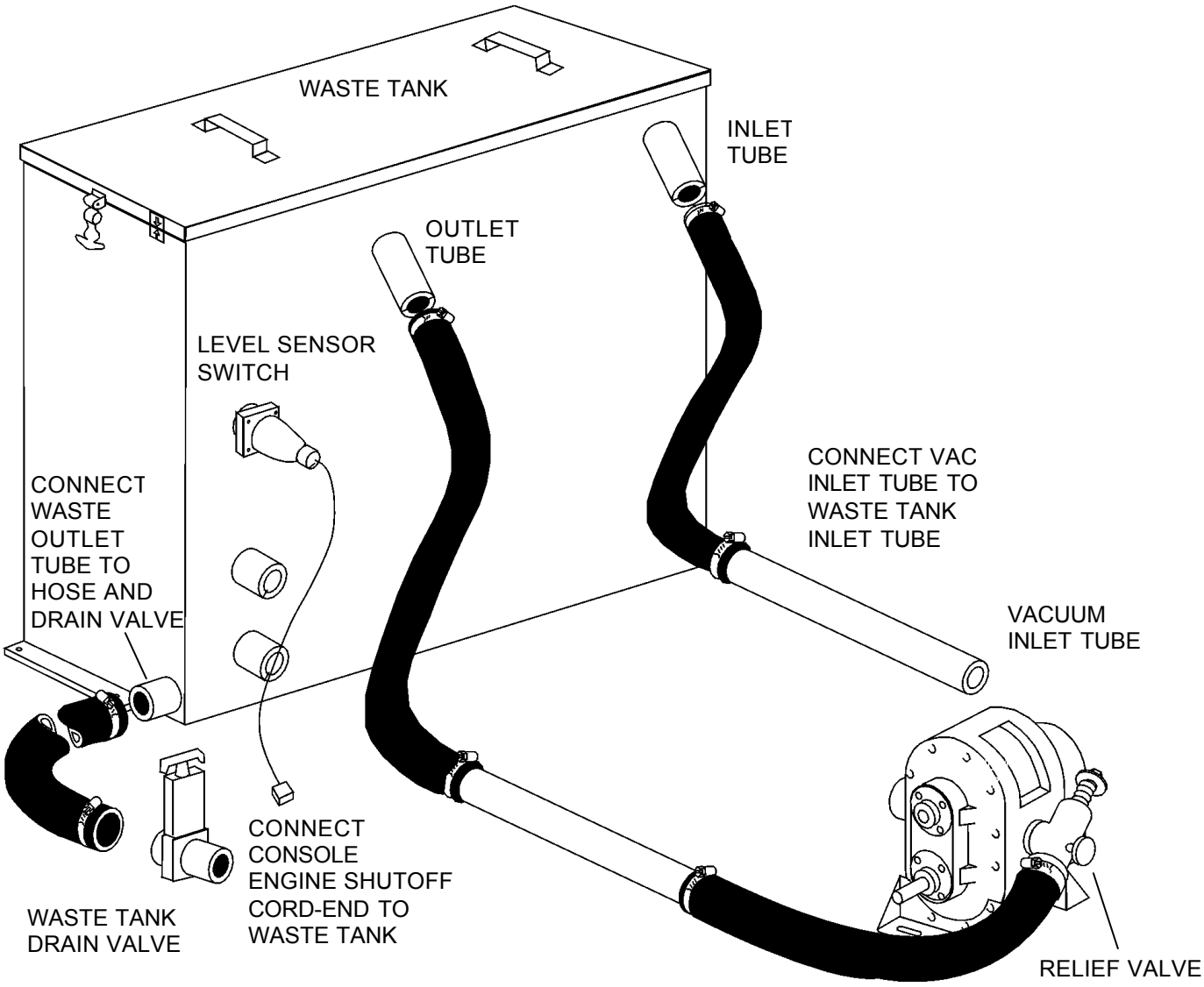
2. Next, attach the black negative (-) battery cable from the console ground to the negative (-) terminal on the battery and tighten the holding nut.

BATTERY HOOK-UP



FIRE EXTINGUISHER

We recommend that a fire extinguisher, preferably rated for A, B, & C type fires, be installed inside the vehicle.


WASTE TANK
INLET TUBE
OUTLET TUBE
LEVEL SENSOR SWITCH
CONNECT VAC INLET TUBE TO WASTE TANK INLET TUBE
CONNECT WASTE OUTLET TUBE TO HOSE AND DRAIN VALVE
VACUUM INLET TUBE
CONNECT CONSOLE ENGINE SHUTOFF CORD-END TO WASTE TANK
WASTE TANK DRAIN VALVE
RELIEF VALVE

SPECIAL INSTRUCTIONS:

1. Cut hoses to fit, if necessary. Make certain that the waste outlet hose is long enough to reach the outside of the vehicle before cutting. All hoses are 2" I.D. internal vacuum hose.

2. When cutting hoses, make certain that the cutting blade is facing away from you hands, fingers, or any other part of your body to avoid injury.

3. Do not install hoses with excessive bends or kinks.

4. Place clamps on hoses before installing.

5. Tighten all hose clamps firmly.

AUXILIARY WATER TANK CONNECTION

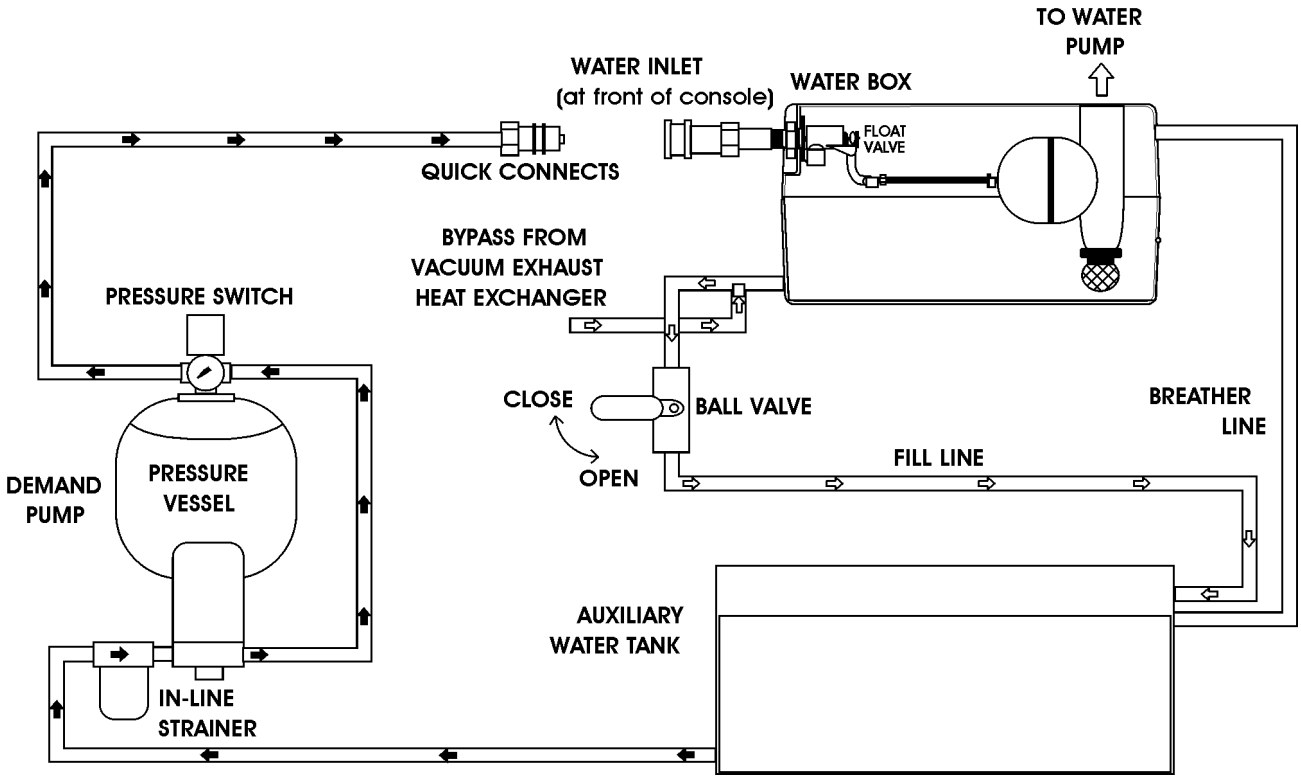
Your cleaning unit may be equipped with an auxiliary water tank. If so, you will need to install the demand pump assembly. (See "Illustrated Parts Listings" for demand pump dimensions.)
The demand pump should be situated in a location where it is easily accessible. We have provided hoses which are long enough to reach their connections on the console and auxiliary water tank.

(Figure 12) illustrates how the demand pump works with the auxiliary water tank and how it connects to the console.

1. Connect the ¾" I.D. water hose coming from the in-line strainer on the demand pump to the barb fitting at the bottom rear, right side of the water tank. Trim the hose for the best fit. Tighten the hose clamps.
2. Connect the demand pump cord to the 2-pole connector on the console (located on the left side of the console near the vacuum pump.)

⚠ CAUTION: When using the auxiliary water tank as your water source, be sure you have enough water in the tank to complete the job.

3. Connect the hose from the demand pump to the water inlet at the front of the console.
4. Turn the demand pump toggle switch "ON."
5. See "Filling Auxiliary Water Tank" in this manual.



WATER PUMPING SYSTEM

(See diagram following page). Cold water enters the console through the water inlet connection located on the lower front panel. The water flows to the water box through a float valve, which shuts off water flow when the water box is full.

When the water pump clutch is energized water flows through a strainer into the water pump where it is pressurized.

Because the water is constantly being pulled and pushed from the pump, a means to cushion these pulsations is required. A nitrogen-charged accumulator has been provided to reduce pressure fluctuations.

A pressure regulator has been provided to maintain the desired pressure setting. If the tool valve is closed, water flows through the pressure regulator into the water box.

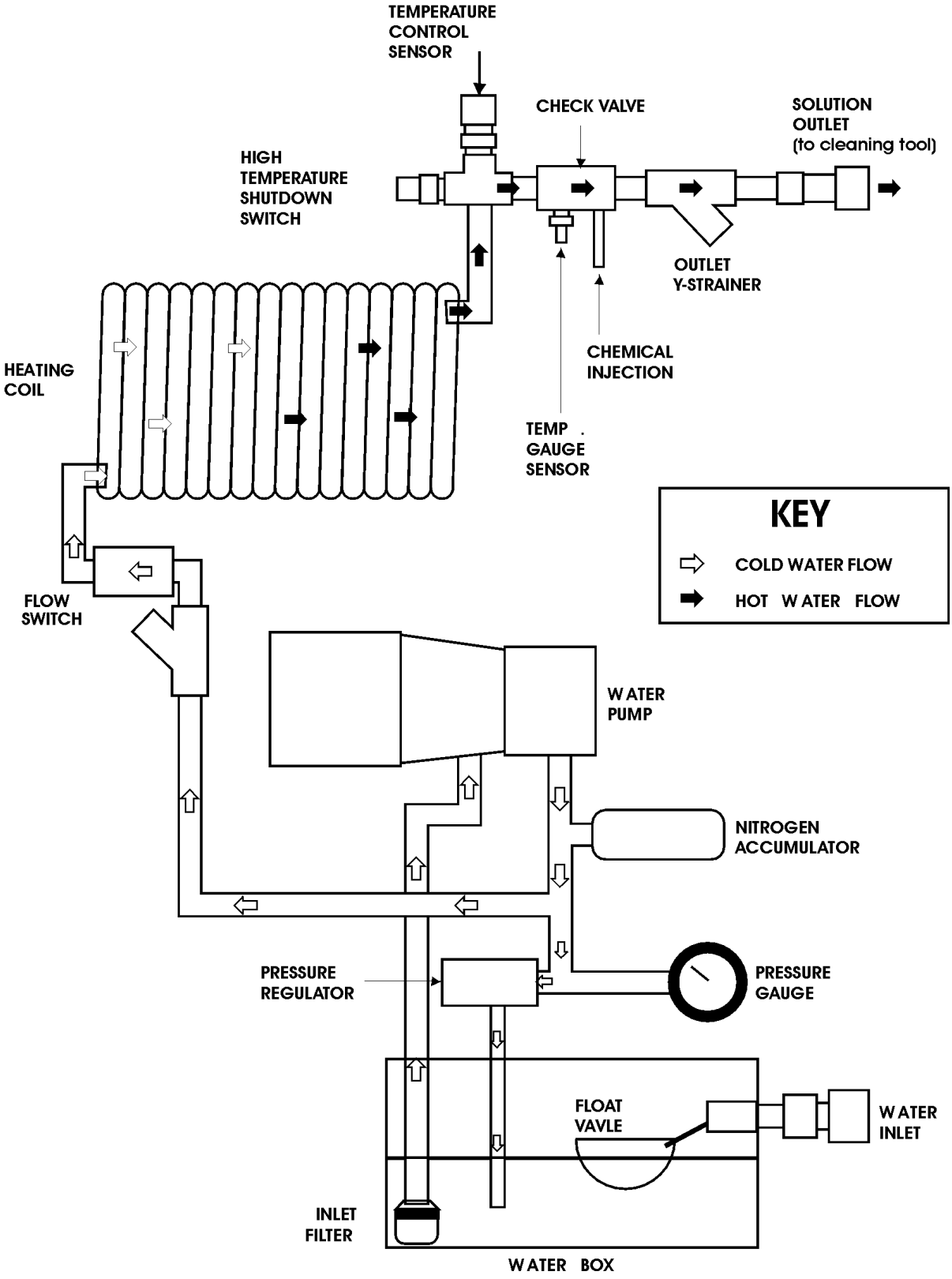
When the tool valve is open, water flows through a differential check valve which, by using differential pressure applied to a flow-activated control, assures that the burner will only function when there is water flow.

The water then flows through a progressive style heating coil where it is heated to the desired temperature. As the hot water leaves the coil it flows by a high limit temperature switch. This switch will shut the unit down if the heat becomes excessive.

Next, the hot water flows through the check valve and Y-strainer to the outlet manifold.
This is where chemical injection occurs. The check valve also contains the temperature gauge sensor. The hot solution then flows into the cleaning tool.

Temperature is adjusted primarily using the thermostatic temperature control. This control turns the burner on when required, if the tool is open. The temperature sensor for this control is located on a tee at the coil outlet.

WATER PUMPING SYSTEM

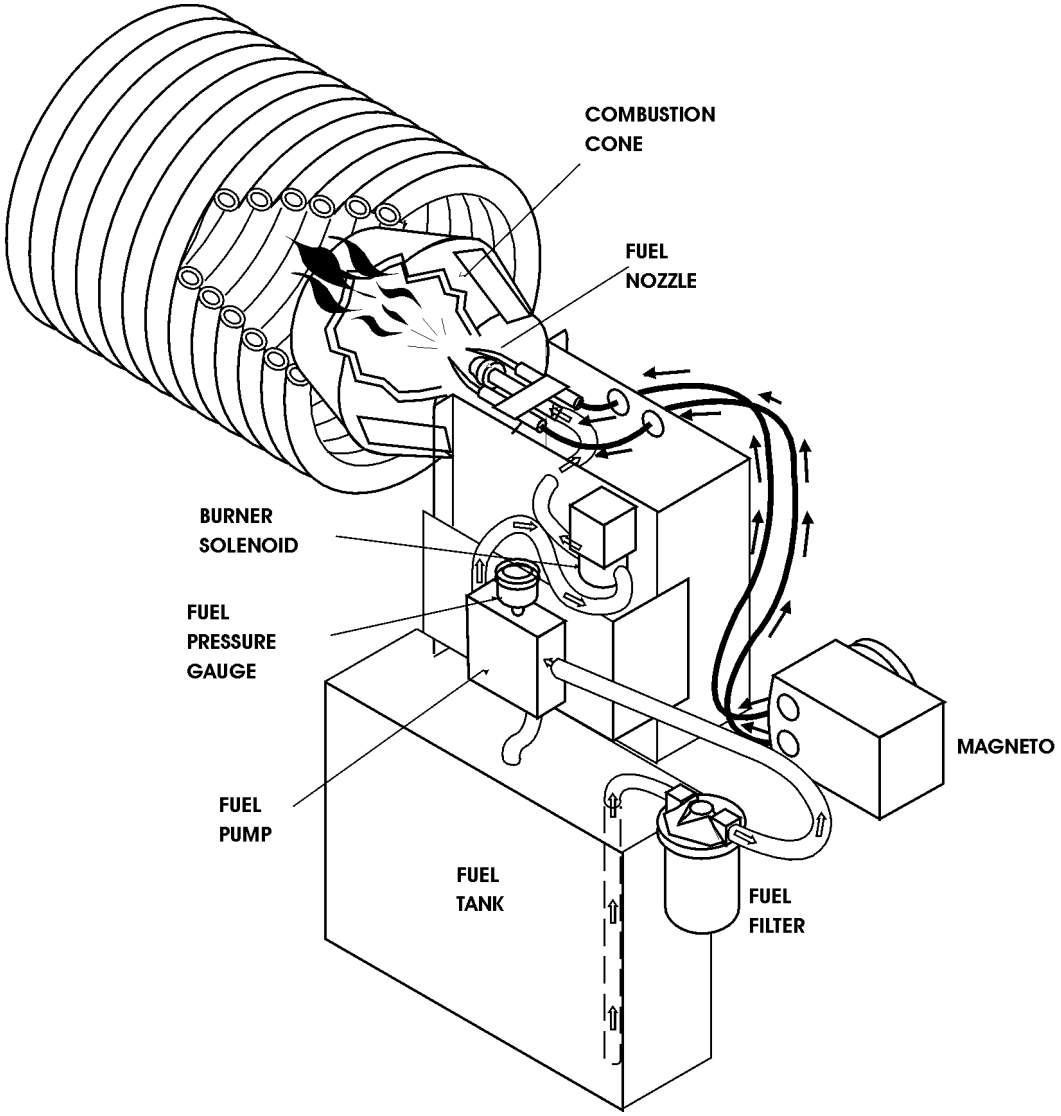


FUEL BURNER SYSTEM

The fuel oil flow system is a conventional “two-pipe” oil burner flow which assures automatic priming of the fuel pump and never a loss of prime as long as fuel is in the tank. The burner fuel is being pulled from the fuel tank through the fuel filter by the fuel pump. The fuel pump sends the burner fuel (the fuel is now pressurized to 100 PSI) though a burner solenoid, a burner tube, and into the fuel nozzle where it is again filtered and atomized (sprayed) to a fixed pattern into the combustion cone.

The burner solenoid will allow fuel to pump through the burner nozzle when the burner switch is on, tool valve is open and water is flowing through the system. The flow switch activates the burner solenoid when water is flowing.

When the engine is running, combustion air is always present. The atomized fuel is ignited by a high voltage constant spark which is generated by the magneto.



VACUUM SYSTEM

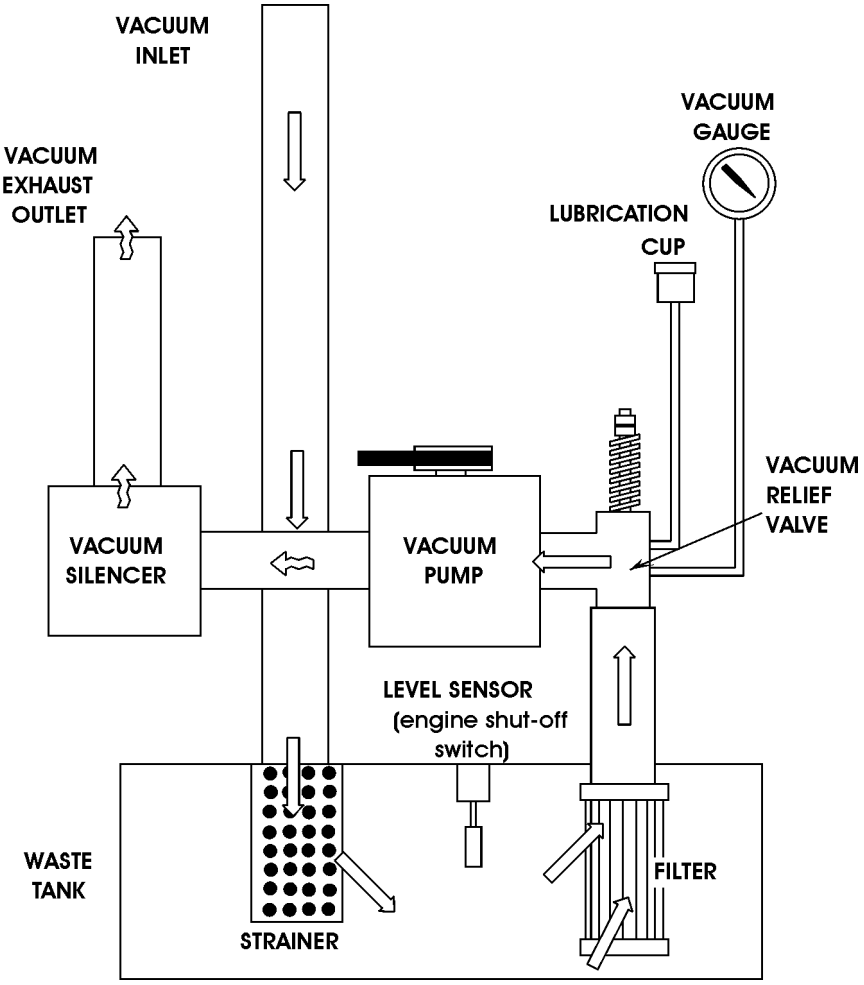
Vacuum flow is initiated by the vacuum pump, with air and water being drawn into the vacuum inlet at the front of the con-sole.

The mixture then flows through a strainer basket into the waste tank. Air exits the waste tank through a 100-mesh filter, and then flows into the vacuum pump. A vacuum pump relief valve has been provided for vacuum pump protection.

The air is discharged from the vacuum pump through the vacuum muffler discharging into the atmosphere.

A level sensor switch located near the top of the waste tank will shut the unit down before the waste tank reaches its full capacity. This protects the vacuum pump from water damage.

⚠ CAUTION: Use of a DEFOAMER will help prevent damage to the unit by a build-up of foam in the waste tank, which may be caused by some chemicals (foam build-up will not activate float switches).



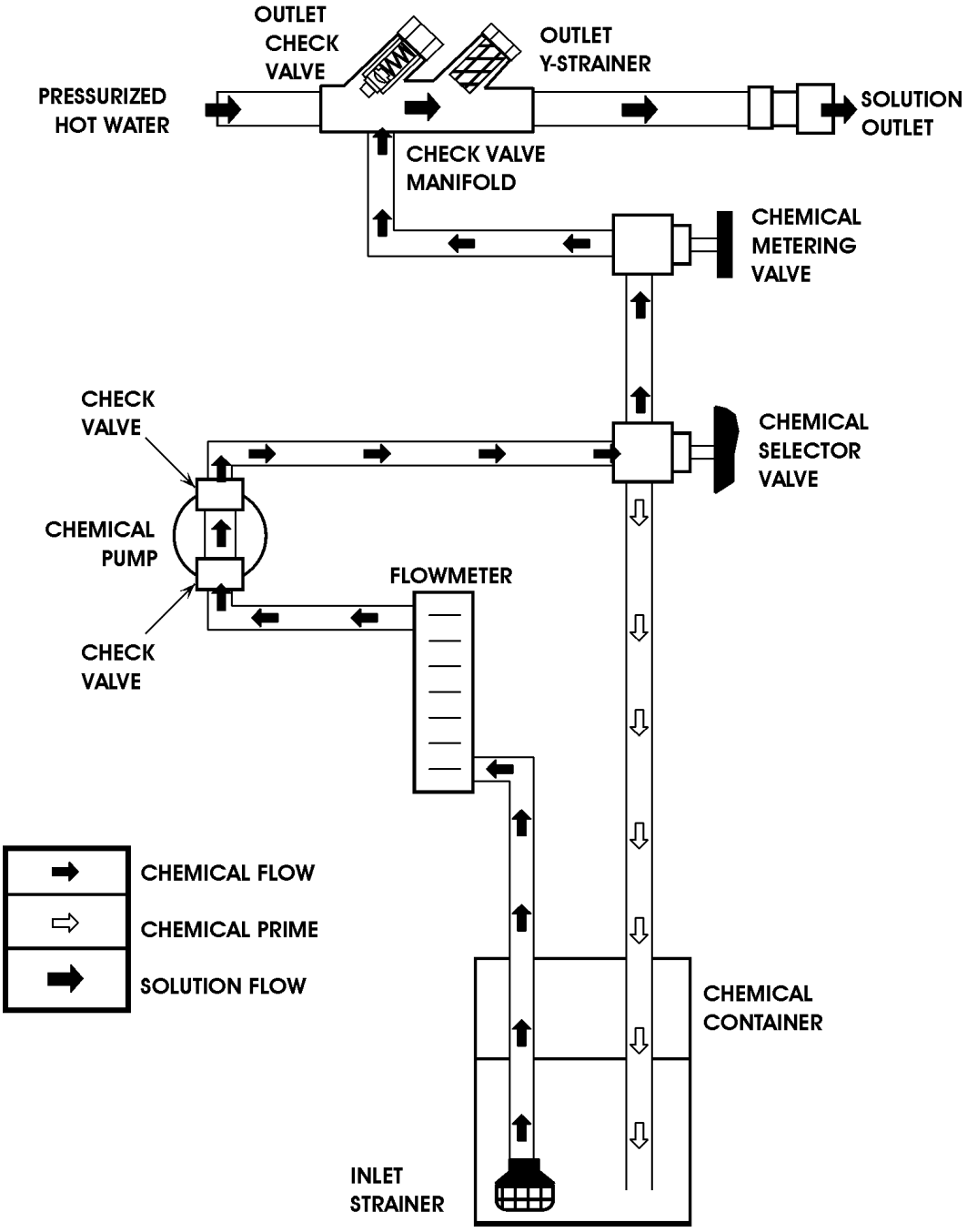
CHEMICAL PUMPING SYSTEM

The chemical is drawn from the chemical container through a strainer into the flow meter. The flow meter indicates the rate of chemical flow.

The chemical then flows through a check valve into a pulse-powered chemical pump.

Next, the chemical pump injects the chemical through a check valve to the 3-way selector valve on the control panel. This valve may turn the chemical flow ON, OFF, or PRIME.

The chemical then flows through a metering valve to the solution outlet. This valve controls the rate of flow of chemical injection into the solution, which is indicated on the flow meter.



ELECTRICAL SYSTEM

Besides the basic engine starting and alternator electrical circuits, your unit has another electrical circuit which, providing conditions are right, will turn your fuel oil burner on and off. This other electrical circuit functions as follows: Current flows from the battery through a circuit breaker to the master switch on the unit. Once this master switch is turned on, the engine may be started and the current will flow to the thermostatic temperature control.

Providing the water temperature is lower than the setting on the thermostat, it will close allowing the current to flow to the burner switch. If this switch is on, current will flow to the water pump clutch switch, if energized, current will flow to the flow switch.

If water is flowing through your unit, this switch will close, allowing current to flow and energize the burner solenoid. When this solenoid is energized, it will open allowing the burner to ignite.

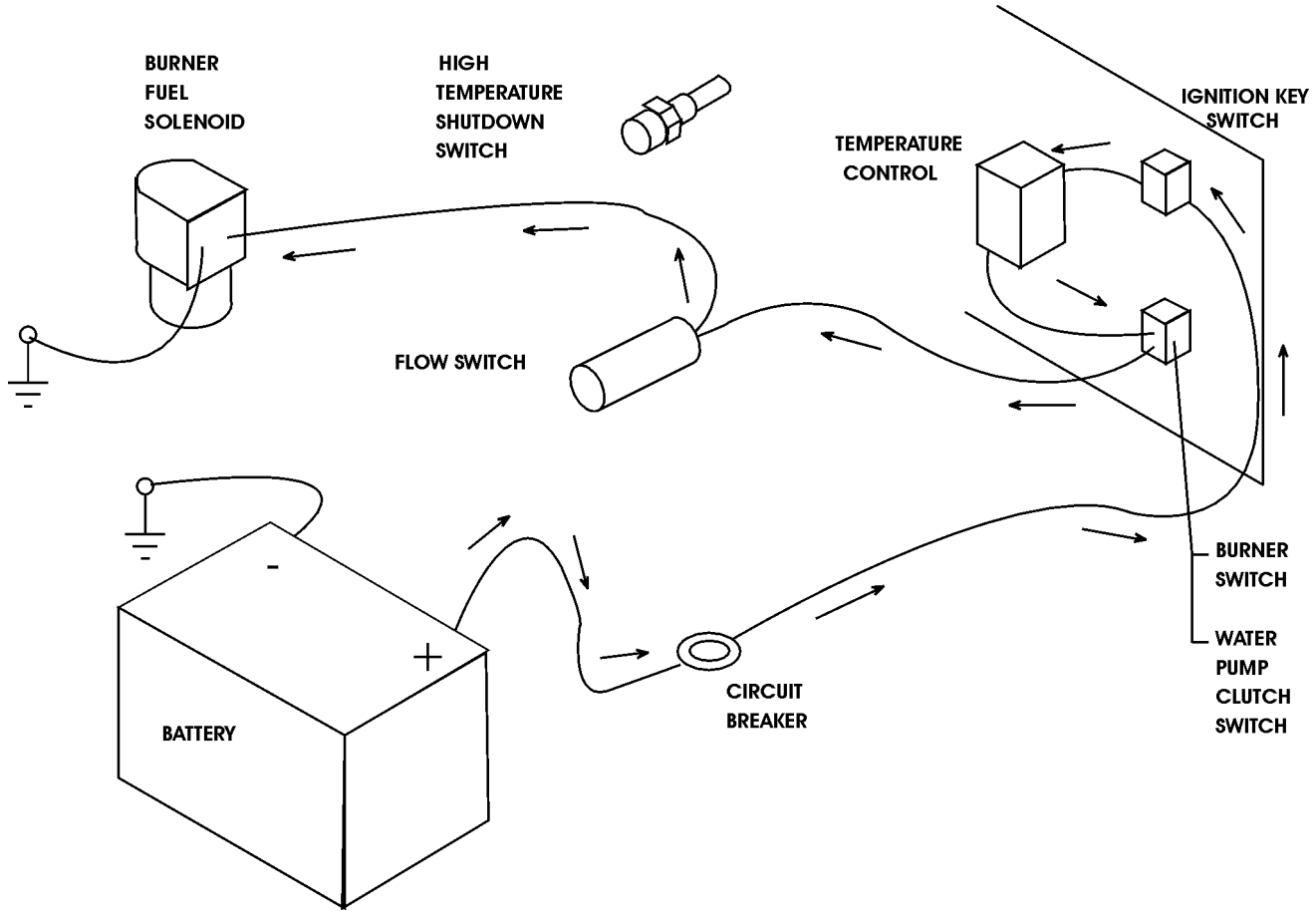
Once your burner is burning, it will continue during the normal operation unless:

1. The cleaning wand is closed. It will shut off and will re-ignite when the wand is opened.

   OR

2. When the temperature reaches the setting on the thermostat, the burner will shut off, and if the temperature drops below the setting, it will ignite.

Besides the manual shut-off on the master switch, there is an automatic shut-off that is energized by a high temperature switch. This switch will automatically shut the unit down in the event of excess temperature.



⚠WARNING: Operate this unit and equipment only in a well-ventilated area. Exhaust fumes contain carbon monoxide which is an odorless and deadly poison that can cause severe injury or fatality. DO NOT operate this unit where the exhaust may enter any building doorway, window, vent, or opening of any type.

Install the **stack outlet adapter** on the stack outlet to exhaust the engine and combustion gases upward.

CHECK FOR ADEQUATE FUEL

Check the burner fuel tank to be certain there is adequate fuel to complete the job. This unit uses approximately .75 gallons of fuel per hour, depending on the speed setting.

Check to make sure your fuel burner tank is full.

REMOVE TOOLS FROM VEHICLE

Remove any **tools** or **hoses** from the van which you will require.

WATER SUPPLY CONNECTION

NOTE: Before connecting your water hose to the supply faucet, flush out the faucet until the water is free of any debris. Flush out any debris which may be in your water inlet hose.

1. Connect the **water supply hose** to the **water inlet** quick-connect at the front of the unit. Connect the hose to the water supply faucet.

NOTE: Never use your waste pump outlet hose as a water inlet hose. Use only clean hoses for water inlet.

2. Turn the **water supply faucet** on. The water will fill the **water box**.

FILLING AUXILIARY WATER TANK

1. Your cleaning unit may be equipped with an auxiliary water tank. To fill the auxiliary water tank, remove cap from tank and fill with water supply hose.

2. Connect the **water supply hose** to the water supply faucet.

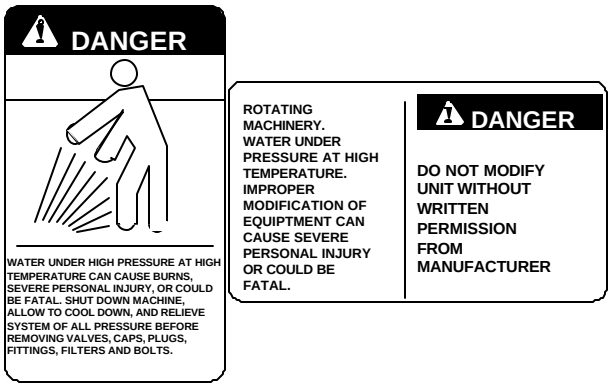
3. Turn the **water supply faucet** on and fill the **auxiliary water tank**.

4. When the auxiliary water tank is full, plug in the hose from the **demand pump** into the water inlet quick-connect at the front of the unit.

5. Turn ON the **toggle switch** at the front of the **demand pump**. **NOTE:** Make sure you turn on the demand pump before you start the unit.

HIGH PRESSURE HOSE

Before starting the unit, connect the **pressure hose** to the **solution outlet connection** at the front of the unit. Connect the **cleaning tool** to the **pressure hose**.


DANGER
WATER UNDER HIGH PRESSURE AT HIGH TEMPERATURE CAN CAUSE BURNS, SEVERE PERSONAL INJURY, OR COULD BE FATAL. SHUT DOWN MACHINE, ALLOW TO COOL DOWN, AND RELIEVE SYSTEM OF ALL PRESSURE BEFORE REMOVING VALVES, CAPS, PLUGS, FITTINGS, FILTERS AND BOLTS.
ROTATING MACHINERY. WATER UNDER PRESSURE AT HIGH TEMPERATURE. IMPROPER MODIFICATION OF EQUIPTMENT CAN CAUSE SEVERE PERSONAL INJURY OR COULD BE FATAL.
DANGER
DO NOT MODIFY UNIT WITHOUT WRITTEN PERMISSION FROM MANUFACTURER

OPERATION

VACUUM HOSE

Connect the **vacuum hose** to the **vacuum inlet** connection at the front of the unit. Connect the other end of the **vacuum hose** to the **cleaning tool**.

STARTING THE UNIT

1. Set the **temperature control** on the control panel to the desired cleaning temperature. The thermostatic temperature control will allow you to increase or decrease the solution temperature automatically. Simply turn the **control knob** to the desired temperature setting.

   Before proceeding, be certain that the control panel indicators are at the following settings:

   Engine – IDLE (Throttle Control In)
   Engine Choke – PULL OUT

NOTE: *It will not be necessary to pull the choke out if the engine is already warmed up.*

2. Turn the **ignition switch** to the START position. The engine will start

NOTE: *If your unit fails to build water pressure after 15 seconds, check for adequate water supply. If necessary, see "Loss of Water Pump Pressure" in the "Troubleshooting" section of this manual.*

3. After starting the engine, push the **choke** in. After the engine has warmed up, pull the **throttle** all the way out and lock it in the full throttle position.

   Allow adequate time for the unit to warm up before beginning the cleaning operation, approximately 5-15 minutes.

PRIMING THE CHEMICAL PUMP

NOTE: *It is recommended that the chemical pump be primed whenever the water pump is ON. This will eliminate possible pressure fluctuations and water pump pulsations related to a dry chemical pump.*

1. Place the **chemical inlet tube** and the **chemical prime tube** into the chemical container.

NOTE: *When placing the* ***chemical inlet tube*** *into the* ***chemical container****, make certain that it stays fully submerged since the chemical pump will not function if air is allowed to enter the inlet line.* ***DO NOT*** *operate the chemical pump without the inlet strainer properly installed.*

a. Turn the **chemical selector valve** on the control panel to the PRIME position. The chemical will then flow from the chemical container through the chemical prime tube Put the **chemical prime tube** into the **vacuum inlet** on the unit and seal off the vacuum inlet. The vacuum will quickly pull chemical from the chemical container. When the chemical starts to flow, turn the **chemical selector valve** to OFF, place the **chemical prime tube** back into the container, and turn the **chemical selector valve** back to PRIME to continue the procedure.

b. Once continuous chemical flow without air bubbles has been achieved, turn the **chemical selector valve** from PRIME to METER. With the **cleaning tool** open, observe the **flow meter** and adjust the **chemical metering valve** until the desired rate of chemical flow is obtained.

STARTING THE BURNER

1. When the water pump is ON , the burner is ready to function.

2. Open the cleaning tool. The burner will fire and will continue to burn (if the cleaning tool is open) until the temperature reaches the setting on the thermostat.

NOTE: The burner will shut off when the cleaning tool is closed.

3. If the burner does not function as described, then refer to “BURNER WILL NOT LIGHT” in the troubleshooting section.

WASTE PUMP

1. If your unit is equipped with an **automatic waste pump**, connect one end of a garden hose to the **pump-out connection** on the console and the other end to an **appropriate waste disposal**.

Turn the **pump-out switch** on the control panel to the ON position. The waste pump will operate automatically throughout the cleaning operation.

We recommend that you use a 3/4" I.D. water hose as a waste pump outlet hose. **DO NOT** use a hose smaller than 5/8" I.D.

NEVER use your automatic waste pump outlet hose as a water inlet hose.

⚠WARNING: NEVER dispose of waste in storm drains, water ways, or on ground areas. Always dispose of waste in accordance with Local, State, and Federal laws.

OPERATION

Once you have completed steps 1 through 10, proceed with the cleaning operation. Your unit should be in the full throttle position when cleaning or extracting. A **float switch** located inside the waste tank will automatically shut down the unit when it reaches its full capacity. When this occurs, empty the waste tank before continuing.

CLEANING

Observe the following guidelines, while cleaning:

1. Before proceeding make sure the nozzles are functioning properly.

a. To check, hold the wand about one foot above the surface to be cleaned and open the wand valve. A full spray should be observed from the cleaning nozzles.

b.

c. If the nozzles are not showing a full spray pattern, adjust nozzles for proper pattern, clean, or replace nozzles, if required.

2. Normally, chemical is applied on the push stroke of the wand when cleaning, and vacuuming is done on the pull stroke. For heavily soiled carpets the wand may be used in a scrubbing manner, applying chemical in both push and pull strokes. Always finish up an area with a vacuum pull stroke.

3. When cleaning, keep the working opening (mouth) flat on the surface being cleaned. Keep the wand moving when the valve is open.

4. The unit will automatically shut-down when the waste tank is full. This will prevent water being drawn into the vacuum pump. If shut-down occurs, empty the waste tank before proceeding.

⚠WARNING: NEVER dispose of waste in storm drains, waterways, or onto the ground. Always dispose of waste in accordance with Local, State, and Federal laws.

UPHOLSTERY CLEANING

Upholstery Tool, Part #60-950422

1. Since the upholstery tool has a lower flow rate and a smaller orifice, turn the temperature control to the desired temperature setting.

2. Use one (1) "80015" spray tip in the tool.

3. Flow adjustment should be made at the tool itself, by using the adjusting knob located on the valve.

STAIR TOOL CLEANING

Stair Tool, Long, Part #78519
Stair Tool, Short, Part #78521

1. Turn the **temperature control** to the desired temperature setting.

2. Use one (1) "9502" spray tip in your stair tool.

FLOOD RESTORATION

⚠ CAUTION: Turn water pump switch off. (This will stop all water flow, and the burner will not function.)

Proceed to do flood restoration.

SHUTDOWN AND DAILY MAINTENANCE

1. Close the chemical metering valve by turning the knob all the way clockwise.

2. Turn the thermostat down to shut off burner five minutes prior to shutting the unit down.

3. Run fresh water through the **chemical injection system** to flush out chemicals.

4. We recommend removing as much moisture from your **vacuum hoses** as is reasonable. This will prevent spillage of solution in your vehicle when replacing hoses.

5. Position the **throttle control** to about 3/4 of the way out, but no less than 1/2 of the way out.

6. Disconnect the **vacuum hoses** from the unit.

7. Push the **throttle** all the way in to idle and allow the unit to run for **1 minute** in order to remove all moisture from the **vacuum pump**.

NOTE: If finishing for the day: Pull the throttle all the way out, plug the vacuum inlet and spray WD-40 (or equivalent) into the vacuum lubrication cup (located at front of console) for 5 seconds. This will lubricate the vacuum pump. Pull the throttle back to idle and continue to step #8.

8. Turn the **ignition switch** to the "OFF "position.

9. Turn the **water supply faucet** off. Bleed the pressure out of the **water supply hose** by loosening the hose at the water supply. Unhook the **water supply hose** and store in vehicle.

10. Relieve pressure from the **cleaning tools and pressure hoses** by activating the valve on the tools. Disconnect the **tools and pressure hoses** from the unit and store all items.

11. Drain the **waste tank** and dispose of waste in a proper manner.

⚠ WARNING: NEVER dispose of waste in storm drains, water ways, or on ground areas. Always dispose of waste in accordance with Local, State, and Federal laws.

12. Remove the **strainer basket** from the waste tank, clean out any accumulated debris, and re-install. Inspect the **vacuum inlet filter** inside the **waste tank**. If there is any lint or debris, remove and clean filter.

NOTE: When removing the vacuum inlet filter, grip the plastic hexagonal section of filter. Grasping filter by the screen may collapse or ruin the filter. Re-install the filter hand tight. NEVER operate this unit with this filter removed, damaged or improperly installed.

NOTE: When replacing this filter, we recommend using the stainless steel filter, Part #14-806509, only.

13. At the end of your work day, rinse out the waste tank with fresh water. Mildew odor treatment may be added to the waste tank to inhibit the growth of bacteria.

14. Clean the unit, tools, hoses, van interior, etc., as needed. Inspect ALL equipment for any damage, wear, leaks, etc.

ADDING ANTI–FREEZE TO YOUR UNIT

1. Shut off the water supply. Disconnect the **water inlet hose** from the front of your console.

2. Connect all **high pressure hoses and tools** that may have water in them.

3. Fill the water box with approximately two gallons of 100% glycol base anti-freeze.

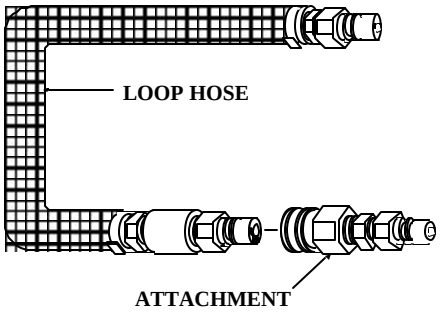
4. Open the tool valve until anti-freeze begins to come out of the tool. Recover **ALL** anti-freeze that comes out of the tools into an approved container. We strongly recommend that you re-cycle and re-use the anti-freeze.

   Repeat this procedure with all the remaining tools. After all tools and pressure hoses have been filled with anti-freeze, disconnect and store them.

5. Turn the **water pump switch** OFF. Attach the **winterizing loop hose** with attachment, Part #10-805380, to the solution outlet connection and the water inlet connection. Turn the **water pump switch** ON.

   Allow the unit to run for approximately 3 minutes with the winterizing loop hose attached.

WINTERIZING LOOP HOSE ASSEMBLY, #10-805380



6. Prime the **chemical system** with a 50/50 anti-freeze/water mix. Insert the chemical inlet and prime tubes into the anti-freeze container. Turn the **chemical valve** to PRIME until antifreeze begins to flow out of the prime hose. Now turn the **chemical valve** to the ON (CHEMICAL) position, making certain that the flow meter indicates flow. Make certain that all anti-freeze drains out of the chemical hose into an approved container.

   After 20 seconds, turn the **chemical valve** to the OFF position. Turn the **temperature control** on the control panel to 50°F for 10 seconds.

7. After completing these procedures, shut the unit down. The unit is now “winterized”.

REMOVING ANTI–FREEZE FROM THE UNIT

1. Connect one end of the **winterizing loop hose** to the solution outlet connection. Place the other end of the loop hose, without the attachment, into an approved container.

2. Start the unit. At idle, allow the anti-freeze to flow into the container until pressure drops then shut the unit down.

3. Fill the water box with fresh water and repeat step #2.

4. Connect the **water inlet hose** to the water inlet connection on the console. Turn the water supply on.

5. Connect all **solution hoses and any tools** which require purging of anti-freeze to the solution outlet connection.

6. Open the tool valves and drain the anti-freeze into an approved container until the flow is clear and all anti-freeze is purged from the tools and hoses.

7. Place the chemical prime hose into the approved container. Submerge the chemical inlet hose in water. Turn the **chemical valve** to the PRIME position until clear water comes through the prime hose, and then remove the prime hose from the container.

   Turn the **chemical 3-way valve** to the METER position. This will allow water to flow into the other side of the system.

   Once all of the anti-freeze is removed, the unit is ready to use.

   Eventually, the anti-freeze in your storage container will become diluted with water. If the anti-freeze level drops below 50% of the total, dispose of it and start with fresh 100% anti-freeze.

⚠WARNING: When disposing of used anti-freeze, observe local laws and regulations. Where permitted, we recommend disposal in sanitary sewer systems. Do not drain onto the ground or into storm drainage systems.

SERVICE SCHEDULE

Engine	Daily	Check engine oil level. *** Fill to proper level
Vacuum Pump	Daily	Spray WD-40 in lubrication cup at front of console for 5 sec.
Water Pump	Daily	Check oil level.** Fill to proper level
Vacuum Inlet Filter (In Waste Tank)	Daily*	Clean filter, inspect, replace if damaged
Vacuum Hoses	Daily	Wash out with clean water
(Optional) Automatic Water Pump	Daily	Inspect and remove any debris or sediment
Vacuum pump	Weekly*	Check oil level. Fill to proper level
Engine	Weekly	Examine air intake and cooling areas. Clean, if required.
Engine	Weekly	Check air cleaner for dirty, damaged, or loose parts.
Water pump inlet filter (in water box)	Weekly*	Check for debris and clean
Battery	Weekly*	Check for proper fluid level. Fill with distilled water only
Bypass manifold orifice & strainer	Weekly*	Inspect and remove any debris or blockage
Solution outlet Y-Strainer	Monthly*	Inspect and remove any debris or blockage
High pressure hoses	25 hrs*	Inspect for damage or impending damage
Engine	25 hrs	Service air cleaner elements*
Pressure regulator	50 hrs	Lubricate o-rings
Engine	100 hrs	Change engine oil***
Engine	100 hrs	Service air cleaner element.*
Battery	100 hrs*	Clean battery terminals
Engine	100 hrs	Removing cooling shrouds and clean cooling system.
Engine	100 hrs	Check condition & re-set gap on spark plugs.
Engine	100 hrs	Change oil filter.***
Chemical valves	200 hrs*	Inspect and/or adjust packing nuts.
Water pump	500 hrs	Change oil.**
Vacuum pump	500 hrs	Lubricate bearing on pulley end with grease.
Pulley set screw & hub screws	500 hrs	Check for proper torque values. Re-torque, if required.
Water pump	500 hrs	Change oil**
Vacuum pump	250 hrs	Lubricate bearing on pulley end with grease
Burner fuel filter	300 hrs	Change and have re-charged with nitrogen, if required
Pulley set screws & hub cap screws	500 hrs	Check for proper torque valves. Re-torque, if required****
Drive pulley	500 hrs	Inspect, clean and check for pulley groove wear****
Drive pulley	500 hrs	Check pulley alignment****
Drive belts	500 hrs	Inspect and clean****
Drive belts	500 hrs	Check belt tension****
Magneto	500 hrs	Change points and condenser
Burner nozzle & burner electrodes	500 hrs	Change burner nozzle & burner electrodes
Chemical pump & check valves	1000 hrs	Replace diaphragm and check valves
Check valve (solution outlet)	1000 hrs	Inspect, clean, and repair, if needed
Vacuum pump	Yearly	Drain, flush, and replace oil *****
Vacuum inlet filter (in waste tank)	Yearly*	Replace
Nitrogen accumulator	Yearly*	Check and have re-charged with nitrogen, if required

* Or as often as required
** Change water pump crankcase oil after the first 50 hours
***Change engine crankcase oil and filter after the first 50 hours
****Perform drive belt, pulley and hub maintenance after the first 25 hours of operation, and then again at 100 hours
*****If using AEON PD synthetic lubricant, 4500 hours or every 2 years, whichever comes first

MAINTENANCE

⚠WARNING: DO NOT service this unit while it is running. The high-speed mechanical parts as well as high temperature components may result in severe injury, severed limbs, or fatality.

NOTE: Use the hour meter as a guide for coordinating the maintenance schedule.

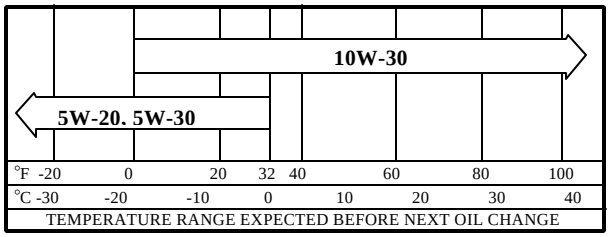
ENGINE

Major repairs should **NOT** be attempted without a thorough knowledge of all components of the engine. Therefore, we strongly recommend having service or repairs performed by an authorized engine dealer.

General maintenance, filter changes, oil changes, etc., should be performed as recommended by the Briggs & Stratton Engine Operation and Maintenance Manual (#67-945308). Use the engine manual as a detailed guide for all matters concerning the engine. The following is a condensed version of maintenance procedures:

1. Check the engine oil level **daily**, when in use. Make certain that proper oil level is maintained. **NEVER** overfill. Use high quality detergent oil of at least API (American Petroleum Institute) service class SJ or SH. Select the viscosity based on the air temperature at the time of operation as shown in the following table. NOTE: Using less than service class SF or SG oil or extending oil change intervals longer than recommended can cause engine damage.

RECOMMENDED SAE VISCOSITY GRADE



2. It is important that the engine break-in oil is changed after the **first eight hours** of operation. Afterwards, change the engine oil **every 100 hours**.

3. Examine air intake and cooling areas **weekly**. Clean if required.

4. Check the air cleaner **weekly** for dirty, damaged, or loose parts.

5. Service the pre-cleaner element **every 25 hours**.

6. Service the air cleaner element every **100 hours**.

7. Check the condition of the spark plugs and spark plug gap **every 100 hours**.

8. Remove the cooling shrouds and clean the cooling areas **every 100 hours**.

9. Change the oil filter **every 100 hours**.

NOTE: Perform these maintenance operations more frequently under extremely dirty or dusty conditions.

VACUUM INLET FILTER (IN WASTE TANK)

1. The vacuum filter in the waste tank should be removed and cleaned **daily**. If this is done, the filter will last for a long period of time.

2. Inspect the vacuum inlet filter inside the waste tank. If there is any lint or debris remove and clean filter. Re-install the filter **hand-tight**. Replace this filter **yearly**.

⚠ CAUTION: When removing the vacuum inlet filter, grip the plastic hexagonal section of filter. Grasping filter by the screen may collapse or ruin the filter.

NOTE: When replacing this filter, we recommend using only a stainless steel PROCHEM filter, Part #14-806509.

DRIVE BELTS, PULLEYS, & HUBS

1. Check pulley set screws and/or hub cap screws after the **first 25 hours** and then again at **100 hours**. Re-torque these screws with a torque wrench, using the values on the chart on the next page. Check pulley set screws and/or hub cap screws **every 500 hours** thereafter.

⚠ CAUTION: Make certain that when you re-torque these screws, that you use a clockwise pattern and continue until proper torque is achieved.

TORQUE VALUES		
Component	Inch/lbs	Foot/lbs
Engine hub	264	22
Vacuum pump hub	192	16

2. Check for pulley groove wear, clean belts and pulley grooves, check for worn belts, proper belt tension, and pulley alignment after the **first 25 hours** and then again at **100 hours**.

3. Check for belt ride in the groove. In multiple groove drives, belt ride should be uniform, not more than 1/16" above or below top of pulley groove.

4. Check groove wear area for wear. Side wall of groove should be straight, not dished out. Bottom of groove should show no signs of belt contact.

5. Inspect belts for contaminants, such as oil or grease. Wipe belts clean with detergent and water. Inspect pulley grooves for buildup of such material and remove, if necessary.

6. Check wear surfaces of belt for excessive wear. If they have a slick, glazed look, belts are slipping. Check belt tension. Never replace one belt in a used set, as used belts will elongate. Replace entire set if replacement is necessary.

7. Place a straightedge across the top of belt. There should be no more than 1/2" deflection in the center of the belt, halfway between the pulleys. If there is too much slack, tighten belt, making sure that it stays properly aligned.

8. See the "General Service Adjustments" section in this manual for details.

9. Check alignment with straightedge, string, or machinist level. Correct alignment to as near perfect as possible.

INLET FILTER (TO WATER PUMP)

The filter inside and on the bottom of the water box is rubber with a stainless steel screen. This should be inspected and cleaned on a **weekly** basis. Replace, if damaged.

NOTE: Vacuum all excess water and debris from water box prior to removing strainer.

WASTE TANK STRAINER BASKET

The strainer basket located inside the waste tank should be removed and cleaned whenever it is full of debris. This should be done on at least a **daily** basis

Y–STRAINER (OUTLET)

Inspect the Y-strainer **after the first week** of running the unit by unscrewing the screen and removing any accumulated debris. Inspect the strainer again at **2** and **4 weeks.**

The Y-strainer should then be inspected **every month.** However, if the Y-strainer has a frequent build-up of debris it should be inspected and cleaned more often.

CHECK VALVE (OUTLET)

Inspect the check valve when rebuilding the chemical pump or as needed. Remove and disassemble the check valve. Check the Teflon seat for debris or abnormal wear. Clean or replace seat if needed.

NOTE: Improper seating of the check valve poppet, damaged spring, or o-rings will cause poor operation of the chemical system.

For the procedure, see the "General Service Adjustments" section in this manual for details.

CHEMICAL PUMP

Rebuild the chemical pump **every 1000 hours**. This involves changing the diaphragm and check valves.

For the procedure, see the "General Service Adjustments" section in this manual for details.

CHEMICAL VALVES

Examine the packing nut on the chemical selector valve, and chemical metering valve **every 200 hours.** Keeping these valve packings properly adjusted will eliminate possible leakage from the valve stems and add to overall valve life.

For the procedure, see the "General Service Adjustments" section in this manual for details.

NITROGEN ACCUMULATOR

The nitrogen accumulator is pressurized to 250 PSI and must be replaced periodically. The accumulator cannot be repaired or recharged. We recommend replacement every 1000 hours of use.

PRESSURE REGULATOR

Lubricate the o-rings **every 100 hours.** Use o-ring lubricant Part #05-008035.

For the procedure, see the "General Service Adjustments" section in this manual for details.

VACUUM HOSES

To assure maximum hose life, we recommend that the hoses be washed out with clean water at the end of **each working day.**

BATTERY

⚠ WARNING: Dangerous Acid, Explosive Gases! Batteries contain sulfuric acid. To prevent acid burns, avoid contact with skin, eyes and clothing. Batteries produce explosive hydrogen gas while being charged. To prevent a fire or explosion, charge batteries only in well ventilated areas. Keep sparks, open flames, and other sources of ignition away from the battery at all times.

Keep batteries out of the reach of children. Remove all jewelry when servicing batteries. Before disconnecting the negative (-) ground cable, make sure all switches are OFF. If ON, a spark will occur at the ground cable terminal which could cause an explosion if hydrogen gas or gasoline vapors are present. When disconnecting the battery, ALWAYS disconnect the negative (-) terminal FIRST.

1. Check the fluid level in the battery **every 25** hours or **once a week.** If low, fill to the recommended level with **distilled water ONLY.**

NOTE: DO NOT overfill the battery. Poor performance or early failure due to loss of electrolyte will result.

2. Keep the cables, terminals, and external surfaces of the battery clean. A buildup of corrosive acid or grime on the external surfaces can cause the battery to self-discharge. Self-discharge occurs rapidly when moisture is present.

   The battery terminals should be cleaned **every 100** hours to prevent corrosion build-up. Wash the cables, terminals and external surfaces with a mild baking soda and water solution. Rinse thoroughly with clear water.

⚠ CAUTION: DO NOT allow the baking soda to enter the battery cells as this will destroy the electrolyte.

MAGNETO

To assure long magneto life, make sure that the ignition wires are firmly in the magneto cover and the magneto is kept dry. Providing this is done, then the only servicing which the magneto will require is that the points and condenser should be changed **every 500 hours.** Always change the magneto points whenever you change the burner oil nozzle and burner electrodes.

HIGH PRESSURE HOSES

Inspect your high pressure hoses for wear after the **first 100 hours** of use. Inspect **every 25 hours thereafter**. If hoses show any signs of damage or impending rupture, **replace the hose** .

⚠ WARNING: DO NOT attempt to repair high pressure hoses! Repairing high pressure hoses may result in severe burns and serious injury!

All high pressure hoses must be rated for 3000 PSI at 250°F. Thermoplastic hoses do not meet these specifications and should not be used. Severe burns and injury may result if the hoses do not meet these requirements.

BURNER NOZZLE & ELECTRODES

Replace the burner oil nozzle and burner electrodes **every 500 hours.** Always change the burner nozzle and the burner electrodes whenever you change the magneto points.

OPTIONAL WASTE PUMP-OUT

At the end of each work day, make certain that you remove any debris or sediment which may be inside the waste pump.

Remove the waste pump unit from the waste tank and clean inside the screen at least **once a week, or more frequently if required.**

GENERAL ADJUSTMENTS

⚠ WARNING: DO NOT service this unit while it is running. The high-speed mechanical parts as well as high temperature components may result in severe injury, severed limbs, or fatality.

ENGINE SPEED

1. To adjust the engine RPM, refer to the Briggs & Stratton Engine Operation and Service Manual for specific instructions.

⚠ WARNING: DO NOT attempt to adjust without a tachometer and NEVER adjust the engine above 2600 RPM.

FUEL BURNER PRESSURE

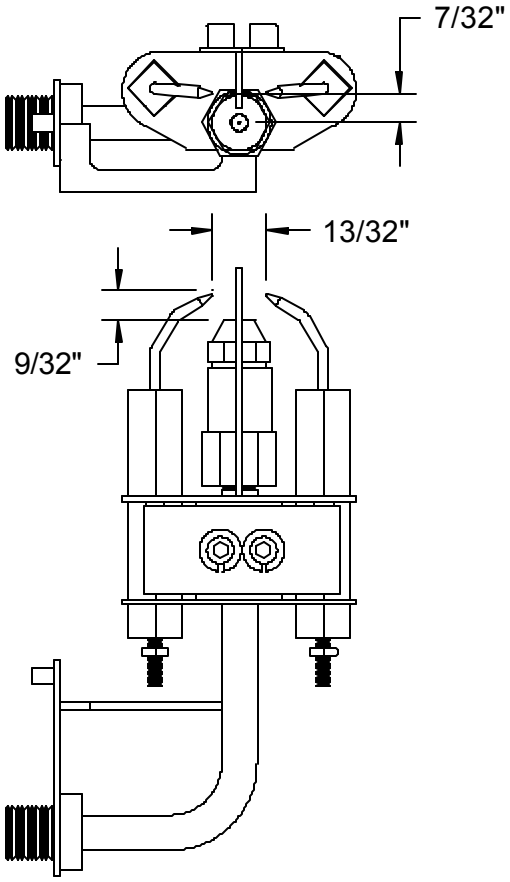
The fuel burner pump pressure adjustment screw is located on the right side of the pump while looking at its name plate. While the unit is running at full RPM, insert a screwdriver and adjust until the fuel pressure gauge reaches 100 PSI.

BURNER COMBUSTION AIR

The combustion air comes from a squirrel cage impeller. The air inlet is fitted with an adjustment. Air adjustment can best be measured with a smoke tester (Bacharach Model RCC_B or equal.) Factory setting is for a number 2 smoke spot or better. If you do not possess a smoke tester, then observe the burner exhaust gases. Black smoke indicates not enough air, white smoke indicates too much air. To adjust, loosen the locking nuts, and turn the adjusting screws until the combustion gases are clean.

BURNER ELECTRODES

Proper positioning of the electrodes is critical to assure normal ignition and clean burning. The design of the burner is such that the electrodes are locked in the proper position when they are installed in the electrode bracket. Adjustment is not required.



COIL SOOT DEPOSITS

If, for some reason, the oil burner does not function properly, soot is probably deposited on the heating coil. If this happens, clean as follows:

1. Remove the stack end plate from the front of your unit.

2. Remove the baffle retainer plate and the coil baffle.

⚠ CAUTION: Take care in removing the baffle. Do NOT break it as it provides a seal for proper combustion. If the baffle is damaged, replace it.

1. Remove the burner belt and the fuel line to the tank.

2. Remove the burner box assembly from the coil casing.

3. Cover the front panel with plastic and pressure wash the coil with the unit tilted (front panel side down). Clean the soot off the coil.

4. When clean, re-assemble the unit.

VACUUM RELIEF VALVE

While the unit is running at full RPM, block the airflow at the vacuum inlet connection and read the vacuum gauge. If adjustment is required, shut the unit down and adjust the vacuum relief valve locking nut tension. Start your unit and read the vacuum gauge. Repeat this process until the relief valve opens at 14" Hg.

VACUUM PUMP DRIVE BELTS

To tighten the vacuum pump belts:

1. Loosen the four nuts which hold the vacuum pump mount in place.

2. Turn the adjusting bolts until the proper belt tension is achieved (1/2” deflection in the center of the belt, halfway between the pulleys).

NOTE: When adjusting belt tension, make certain that the engine shaft and vacuum pump shaft remain parallel, and the belt tension is equal throughout the belt width.

3. After adjusting, re-tighten the four nuts, which hold the vacuum pump mount in position. Check belt alignment with straight- edge.

WATER PUMP DRIVE BELT

To tighten the water pump belt:

1. Loosen the nuts, which hold the water pump mount to base.

2. Adjust the position of the belt tension adjusting bolt until the proper belt tension is achieved. (1/2" deflection in the center of the belt, halfway between the pulleys).

3. While checking the alignment, tighten the nuts, which hold the water pump mount to base.

FLOAT VALVE (WATER BOX)

The float valve should only be adjusted if the water box is overflowing or the water level in the box is lower than 5-1/2":

1. If the box is overflowing, remove and check the float valve for debris or damage.

NOTE: If the float ball has any water inside it must be replaced.

⚠ CAUTION: When replacing float ball, DO NOT over- tighten, as the rod can puncture the ball. Make sure to tighten the nuts on the rod.

2. Disassemble the valve and check the piston and seat for damage, replace if needed. See the “Illustrated Parts Listing” for a parts breakdown.

MAGNETO BELT

To tighten the magneto belt:

1. Loosen the 2 nuts, which hold the magneto assembly in place.

2. Slide the magneto until the proper belt tension is achieved. (1/2” deflection in the center of the belt halfway between the sheaves).

3. While checking the alignment, tighten the magneto assembly hold-down nuts.

CHECK VALVE (SOLUTION OUTLET)

Inspect the check valve whenever doing service on the chemical pump or if flow problems occur in the chemical system:

1. Remove the check valve. Be sure the small o-ring for the seat comes out with the check valve.

2. Remove the seat, using a 5/16" Allen wrench.

3. Check the Teflon seat for debris or wear. Clean or replace Teflon seat if needed.

4. Clean the poppet and spring, inspect for wear or damage, and replace as needed.

5. Re-assemble the check valve. Start the seat by hand, tighten using a 5/16" Allen wrench. **DO NOT** over-tighten seat.

NOTE: Improper seating of the check valve poppet, damaged spring or o-rings will cause poor operation of the chemical system.

6. Lubricate the o-rings with o-ring lubricant, Part #05-008035, and reinstall.

CHEMICAL PUMP

The only repairs which the chemical pump may require is the replacement of the diaphragm or check valves. To replace the diaphragm, unscrew the cover from the body. When replacing the diaphragm, lubricate the outer edges of the diaphragm with o-ring lubricant, Part #05-008035, and reassemble. To replace the check valves, unscrew the check valve caps. Replace the check valves and reassemble, using new o-rings.

DO NOT attempt to re-use o-rings once the check valves have been removed. See the “Illustrated Parts Listing” for a parts breakdown on the chemical pump.

PACKING NUT ADJUSTMENT FOR CHEMICAL METERING & CHEMICAL SELECTOR VALVES

Examine the packing nut on the chemical metering, and chemical selector valves for proper tension every **200 hours**. When turning the knob, there should be a small amount of resistance. If not, slightly tighten the packing nut. **DO NOT** over-tighten. Keeping the valve packings properly adjusted will eliminate possible leakage from the valve stems and add to overall valve life.

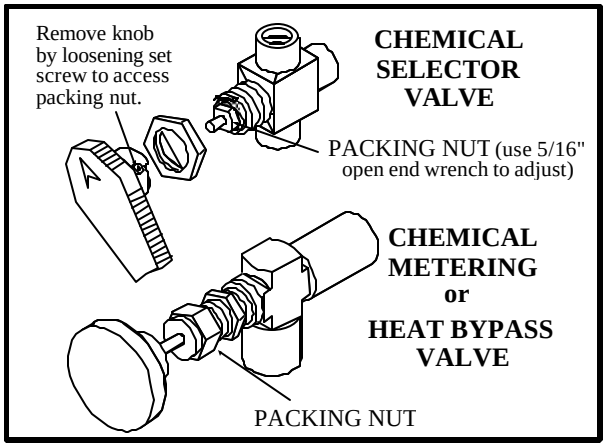

Remove knob by loosening set screw to access packing nut.
CHEMICAL SELECTOR VALVE
PACKING NUT (use 5/16" open end wrench to adjust)
CHEMICAL METERING or HEAT BYPASS VALVE
PACKING NUT

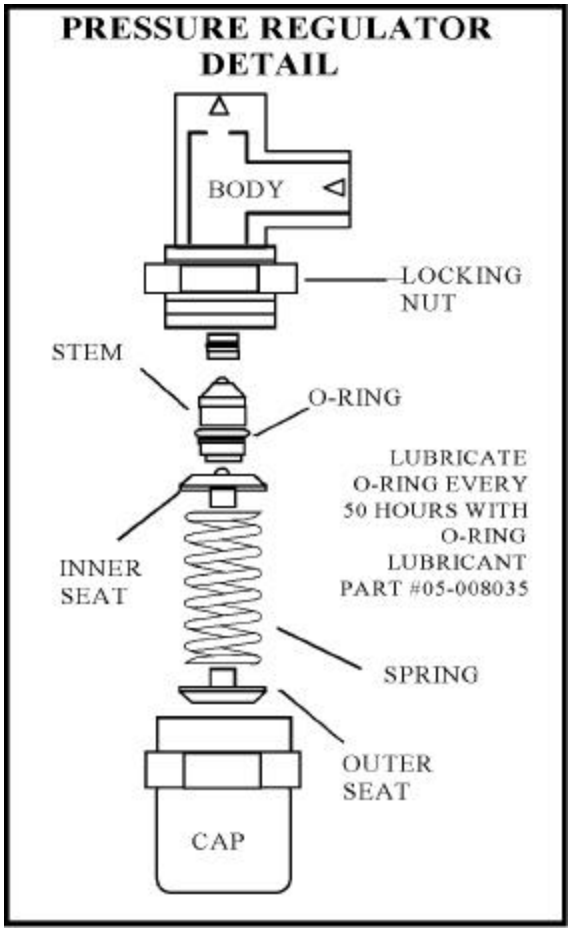
FIGURE 21

PRESSURE REGULATOR

The pressure regulator serves only to hold locked up water pressure at a preset point and to bypass this water back to the water box.

To adjust:

1. With your unit running, close the cleaning tool. Check the pressure gauge. Open the tool valve. We recommend setting the pressure regulator so that the pressure gauge reads 400 PSI with the tool valve **open**.



When the tool valve is opened, there is an approximate drop of 100 PSI in pressure. **If there is a pressure drop greater than 100 PSI, it may be necessary to lubricate the o-rings in the pressure regulator.**

2. If the pressure regulator requires adjustment, turn the adjusting knob (while observing the pressure gauge on the control panel) until the desired pressure is obtained. Turning the knob clockwise increases pressure, turning the knob counter-clockwise decreases pressure.

TEMPERATURE CAPILLARY & PACKING ASSEMBLY

INSTALLATION INSTRUCTIONS

1. Using thread sealant, thread the tapered end of the union fitting into the thermostat manifold and tighten.

2. Slide the jam nut over the capillary bulb with the threaded end toward the end of the capillary bulb.

3. Insert the capillary bulb through the union fitting and into the thermostat manifold.

4. Place the rubber seal onto the capillary tube with the split facing 90° from the top (see the capillary union detail).

5. Fit the four brass disks onto the capillary tube, with two of the brass disks on each side of the rubber seal. Face the notch on one brass disk toward the nearby brass disk to lock the brass disks together. Then face the notches on the brass disks 90° from the split in the rubber seal.

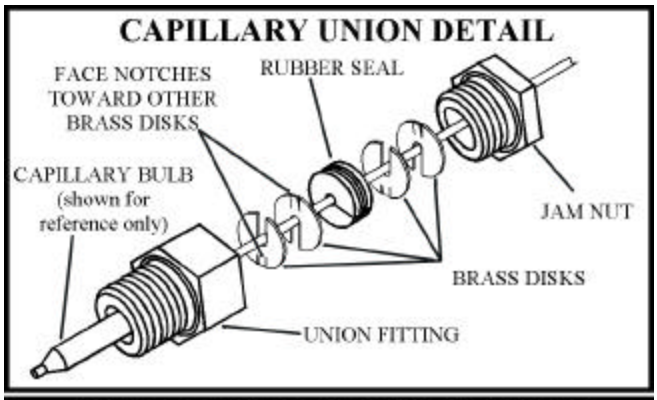
NOTE: Lubricating the facing sides of the brass disks will hold them together on the capillary tube during installation.

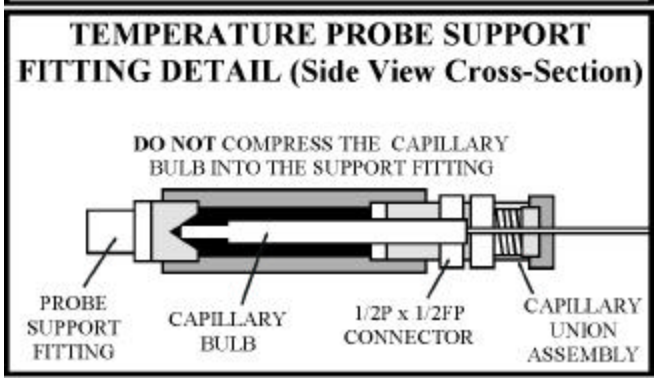
6. Insert the rubber seal and brass disks into the union fitting, hand tight.

7. Position the capillary bulb in the temperature manifold as shown in the illustration. When positioning the capillary bulb, do not allow the bulb to compress against the support fitting.

8. Tighten the jam nut lightly, about 1-1/2 turns.

9. Examine the capillary union assembly for leaks and tighten the union fitting just enough to stop leaks. **DO NOT** over-tighten.




TEMPERATURE PROBE SUPPORT FITTING DETAIL (Side View Cross-Section)
DO NOT COMPRESS THE CAPILLARY BULB INTO THE SUPPORT FITTING
PROBE SUPPORT FITTING
CAPILLARY BULB
1/2P x 1/2FP CONNECTOR
CAPILLARY UNION ASSEMBLY

⚠WARNING: DO NOT service this unit while it is running. The high-speed mechanical parts as well as high temperature components may result in severe injury, severed limbs, or fatality.

The following general instructions are for the repair of various components. ONLY FULLY TRAINED personal should repair components.

GASOLINE ENGINE

Refer to the Operation and Maintenance MANUAL. If more detail is needed, you should procure a Service and Repair book from your local authorized Briggs and Stratton Service center.

VACUUM PUMP

Refer to the Vacuum Pump Maintenance Manual.

WATER PUMP

Refer to the Pump Maintenance Manual.

BURNER FUEL PUMP

The fuel oil pump, when applied correctly, will require no repair; however, if in the course of normal maintenance, you have a very dirty inlet filter, proceed as follows:

1. Remove fuel pump cover.

2. Remove the strainer and clean with a brush using clean kerosene.

3. Re-assemble the pump.

BURNER BEARING

The burner bearing on your unit may be removed if defective. Proceed as follows after removing the impeller and pulley from the shaft.

1. Remove the internal snap rings on each end of bearing.

2. Using an arbor press and pressing down on the cone side, press out the bearing.

3. Replace the snap ring on the cone end. **CAUTION:** When replacing this bearing, always press on the outside race of the bearing. PRESSURE ON THE SHAFT WILL RUIN THE BEARING.

4. Press the new bearing into the plate coupling until it reaches the snap ring on the cone end.

5. Re-install the internal snap ring on the plate side.

BURNER IMPELLER

The burner impeller; may be changed. After the burner bearing and plate have been removed, proceed as follows:

1. Clamp the burner pulley in a vise. CAUTION: DO NOT CLAMP THE PLATE, as the seals in the bearing will be damaged when changing the impeller.

2. Remove the flexible coupling end, and the external snap ring inside the impeller.

3. Loosen the set screw on the impeller hub, the impeller may now be removed.

4. Reassemble with new impeller.

TROUBLESHOOTING

⚠WARNING: DO NOT service this unit while it is running. The high-speed mechanical parts as well as high temperature components may result in severe injury, severed limbs, or fatality.

This chapter of the operator's manual explains how to look for and repair malfunctions which may occur.

Intelligent, accurate troubleshooting is based on a complete and thorough understanding of the WATER, VACUUM, CHEMICAL, HEAT TRANSFER, SAFETY and WIRING systems on this unit.

If there is a malfunction occurring in a system which you do not fully understand, turn back to the "Operation" section of this manual and review "Systems".

In addition, prior to proceeding, you can save time by checking that:

1. The water supply is ON.

2. The engine speed at full throttle is 2800 RPM.

3. Check that water pump volume is correct. Check the pump volume with the cleaning tool closed. Measure the water flow returning to the water box from the pressure regulator. The flow rate should be 3.0 GPM. At that flow rate it would fill a gallon container every 20.0 seconds.

PROBLEM	CAUSE	SOLUTION
	Water supply is turned off or the float valve is stuck or improperly adjusted.	Turn the water supply on or up. Check for kinks in the water supply hose. Examine the float valve and adjust or replace.
	Water pump inlet supply line is plugged or drawing air.	Examine the water inlet filter inside the water box. Remove accumulated debris and replace if required. Check for suction leaks and loose clamps or fittings. Tighten any loose fittings or clamps. Replace any ruptured hose(s).
	Improper engine speed.	Using a tachometer, check the engine speed. Full throttle engine speed is 27 RPM. Re-adjust in accordance with the Briggs & Stratton Engine Operation and Service Manual.
Loss of water pump pressure With the cleaning tool open, the water pressure gauge reads below the normal operating pressure.	Pressure regulator o-rings are dry.	Lubricate o-rings using o-ring lubricant Part #05-008035.
	Pressure regulator has worn o-rings.	Check o-rings. If necessary, replace.
	Pressure regulator is dirty, stuck open, or improperly adjusted.	Clean or repair pressure regulator. Adjust to working pressure. Lubricate o-rings, using o-ring lubricant Part #05-008035.
	Low pump volume. (Measure the amount of water being returned to the water box from pressure regulator. It should fill a gallon container about every 20.0 seconds.)	Examine the check valves, plunger cups, and cylinder head on the water pump. Repair, whenever required. (Refer to the water pump service manual.)
	Defective water pump pressure gauge.	Replace gauge.
	Orifice (spray nozzle) in the cleaning tool is worn, defective, or the wrong size.	Replace nozzle or change nozzle size.
	Debris clogging water lines or water inlet disconnect.	Clean or replace as needed.
	Belt loose or broken.	Re-tension or replace as needed.
Loss of solution volume at cleaning tool orifice. Water pressure gauge reads normal.	Plugged orifice and/or screen in the cleaning tool.	plug or replace orifice and/or screen.
	Internal block between the pressure regulator manifold and the outlet Y-strainer, or the Y-strainer screen is clogged.	Inspect all lines, remove accumulated debris which is blocking proper flow. Replace any defective hoses. Remove, inspect and clean the Y-strainer screen. De-scale the unit and in stall a water softener if necessary.
	Outlet check valve is plugged.	Examine the check valve, remove any debris.
	Defective quick-connect on one or more of the high pressure hoses.	Replace defective quick –connect(s) on high pressure hose(s).
	Cleaning tool valve is malfunctioning.	Repair or replace valve.
	Hose inner lining is constricted.	Remove restriction or replace.

PROBLEM	CAUSE	SOLUTION
Loss if vacuum while cleaning, the vacuum is not up to par. Engine RPM is normal.	Vacuum gauge is giving an improper reading.	Examine the tubing between the vacuum valve and the vacuum gauge and remove any blockage.
	Vacuum hose(s) is damaged, causing a suction leak.	Inspect the vacuum hose(s). Repair any damage or replace.
	Waste tank gasket not sealing properly, not positioned properly.	Inspect the gasket. Repair seal or replace. Re-position lid.
	Plugged vacuum hose or vacuum plumbing between vacuum inlet and strainer basket.	Unplug vacuum hose or inlet plumbing.
	Waste tank filter or strainer basket is plugged.	Clean or replace filter. Clean basket.
	Loose vacuum pump drive belts.	Tighten the drive belts.
	Waste tank drain valve is damaged or left open, causing a vacuum leak.	Drain the waste tank. Close drain valve, if open. Remove the dump valve and after inspecting replace the defective components.
	Vacuum relief valve requires adjustment or has a vacuum leak due to damaged diaphragm.	Re-adjust the vacuum relief valve. If the vacuum does not increase, remove and inspect the relief valve diaphragm. If damaged, replace.
	Vacuum pump worn out.	Replace vacuum pump.
Loss of chemical with cleaning tool valve open, no chemical	Chemical pump is improperly primed.	Refer to chemical pump primping instructions.
	The strainer at the inlet end of the chemical inlet line is clogged.	Unclog the strainer. If damaged, replace.
	Suction leak in the inlet line leading into the chemical pump.	Inspect inlet lines and flow meter for damage and replace, if required.
	Chemical pump check valve(s) is clogged.	Remove any debris from the chemical check valve(s). Replace chemical check valve(s) or seals if necessary.
	Chemical prime-on-off valve or chemical metering valve is defective.	Replace valve(s).
	Chemical pump diaphragm is ruptured.	Disassemble the chemical pump and replace the damaged diaphragm.
	Defective cylinder in the water pump.	Measure the pump volume. If the pump volume is less than normal, refer to “Loss of Pump Volume” in the “Troubleshooting” section in this manual.

PROBLEM	CAUSE	SOLUTION
Chemical flow meter indicates flow with the tool valve closed. **⚠ CAUTION:** When this conditon occurs, shut the unit down **immediately**. Prolonged running will damage the fuel pump.		Tighten fittings. Re-apply thread sealant where required. If any fittings are damaged, replace.
	Outlet check valve is full of debris or damaged, not allowing it to close properly	Close the chemical valve on the instrument panel. If the flow meter does not indicate flow, remove debris or replace check valve if necessary.
	Chemical pump diaphragm is ruptured.	Close the chemical valve on the instrument panel. If the flow meter still indicates flow, replace the chemical pump diaphragm.
	Internal leak in chemical prime valve causing continual flow through prime tube returning to container.	Tighten valve packing nut (see "General Service Adjustments" section in this manual). Replace valve, if necessary.
Loss of fuel oil pressure, with the unit running, the fuel pressure reads zero.	Not fuel oil.	Fill fuel tank with kerosene.
	Loose set screw on the flexible coupling which drive the fuel oil pump.	Tighten setscrew. Loc-Tite (or equivalent) should be applied to prevent the setscrew form loosening.
	Broken flexible coupling which drives the fuel oil pump.	Replace coupling, check for damaged fuel oil pump.
	Fuel filter is plugged.	Change fuel filter element.
	Plugged screen in fuel pump or defective fuel pump.	Clean screen in fuel pump. If necessary, replace fuel pump.
	Suction leak somewhere between the fuel pump and fuel tank inlet.	Locate and correct either by tightening fittings or replacing part.
	Defective pressure gauge.	Replace gauge.
Loss of ignition spark, with the unit running there is no visual indication of a spark. **⚠ CAUTION:** When this malfunction occurs, ALWAYS check inside the burner cone for burner fuel. If burner fuel is present, clean it ALL out before igniting the burner.	Ignition wires not connected to electrode or magneto.	Re-connect wires.
	Broken electrodes.	Replace.
	Faulty magneto.	Repair or replace magneto.
	Magneto drive belt loose or broken.	Tighten or replace belt.

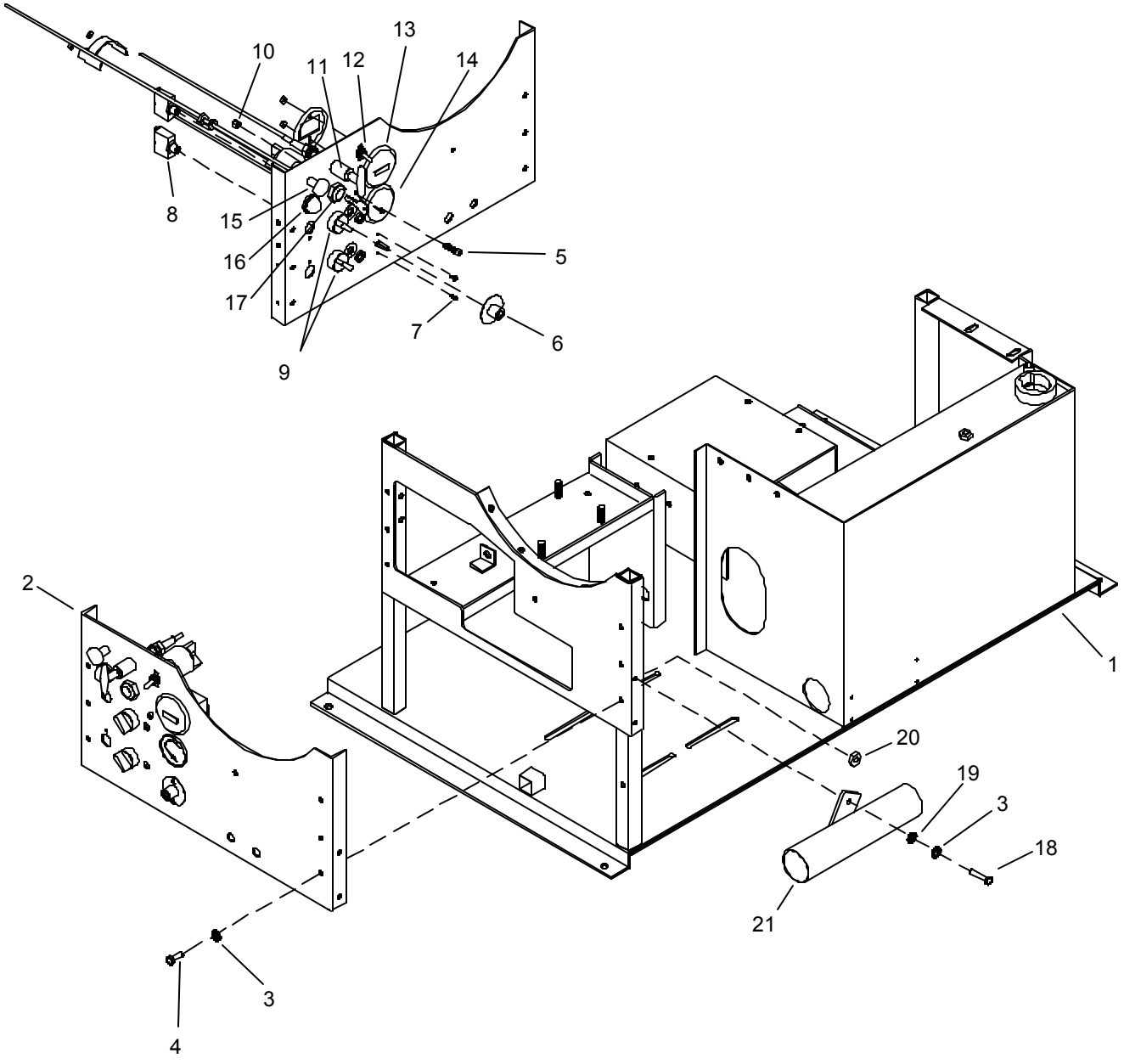
PROBLEM	CAUSE	SOLUTION
Engine will not start. The engine does not turn over.	Main circuit breaker on the control panel has been tripped.	After inspecting the unit to determine the cause of the tripped circuit breaker, press the reset button.
	Loose or corroded battery.	Clean, tighten, or replace the battery terminals.
	Dead battery.	Recharge or replace battery.
	Defective ignition switch.	Test ignition switch for power going in the switch. If there is power going in but **NO** power going out, replace the switch.
	Defective starter motor.	Test the starter motor. If necessary, replace.
	Engine problem.	Refer to the Briggs & Stratton Engine Operation and Service Manual.
	Vacuum pump is seized.	Refer to Sutorbilt Service & Repair manual.
Starter turns over engine, but engine will not start.	Waste tank is full.	Empty waste tank.
	Engine temperature has exceeded 285° F, triggering the high temperature switch to shut the unit down.	Determine the cause of overheating **before** restarting the unit. See "Excessive Heating" in the "Troubleshooting" section of this manual.
	Defective fuel pump.	Replace the fuel pump.
	Loose or broken wires leading to waste tank float switch.	Repair or replace any broken electrical connections.
	Defective float switch in the waste tank.	Disconnect the float switch plugs and bypass the switch. If the unit starts, repair or replace the defective float switch.
	Oil pressure switch (located on engine), fuel shut-off solenoid (located on engine), high temperature switch.	Test these components. If any are defective, replace. Consult the Briggs & Stratton Engine Operation and Service Manual.
	Defective 285° F high temperature shutdown switch.	Test. If necessary, replace.
	Engine is malfunctioning.	Refer to Briggs & Stratton Engine Operation and Service Manual.

PROBLEM	CAUSE	SOLUTION
Engine stops running, while doing normal cleaning.	Engine is out of gasoline.	Add gasoline to the fuel tank.
	Waste tank is full.	Empty waste tank.
	Main circuit breaker on the control panel has been tripped.	After inspecting the unit to determine the cause of the tripped circuit breaker, press the reset button.
	Solution temperature has exceeded 285° F, causing the unit to shut down.	Refer to “Excessive Heating” in the “Troubleshooting” section of this manual.
	Defective fuel pump.	Replace fuel pump.
	Defective float switch inside the waste tank.	Disconnect the float switch plugs and bypass the float switch. If the unit starts, repair the defective float switch.
	285° F solution temperature switch is defective.	Test switch, if necessary, replace.
	Loss of oil pressure in engine.	Check for proper oil level or wrong type of oil being used.
	Defective engine oil pressure switch.	Test switch, if necessary, replace.
	No ignition in the engine or engine is malfunctioning.	Refer to Briggs & Stratton Engine Operation and Service Manual.
Excessive heating	Check instrumentation setting: Temperature control is set at a high temperature.	If cleaning, make certain that the water pump switch is in the ON position. Set temperature control to a lower setting.
	Defective temperature control or temperature control microswitch.	Inspect temperature control for proper operation. Repair, or replace, if necessary.
	Flow restriction caused by hard water scaling.	Descale unit, repair or replace damaged plumbing components as necessary. Install water softener.
Loss of temperature.	Check instrumentation settings: Temperature control is set at a low temperature.	Set the temperature control to a higher setting.
	Defective temperature control.	Inspect temperature control for proper operation. Repair, or replace, if needed.
	Engine RPM is low.	Reset engine RPM. Refer to Briggs & Stratton Operation and Service Manual.
	Defective temperature gauge.	Test gauge and sensor. Replace failed component.

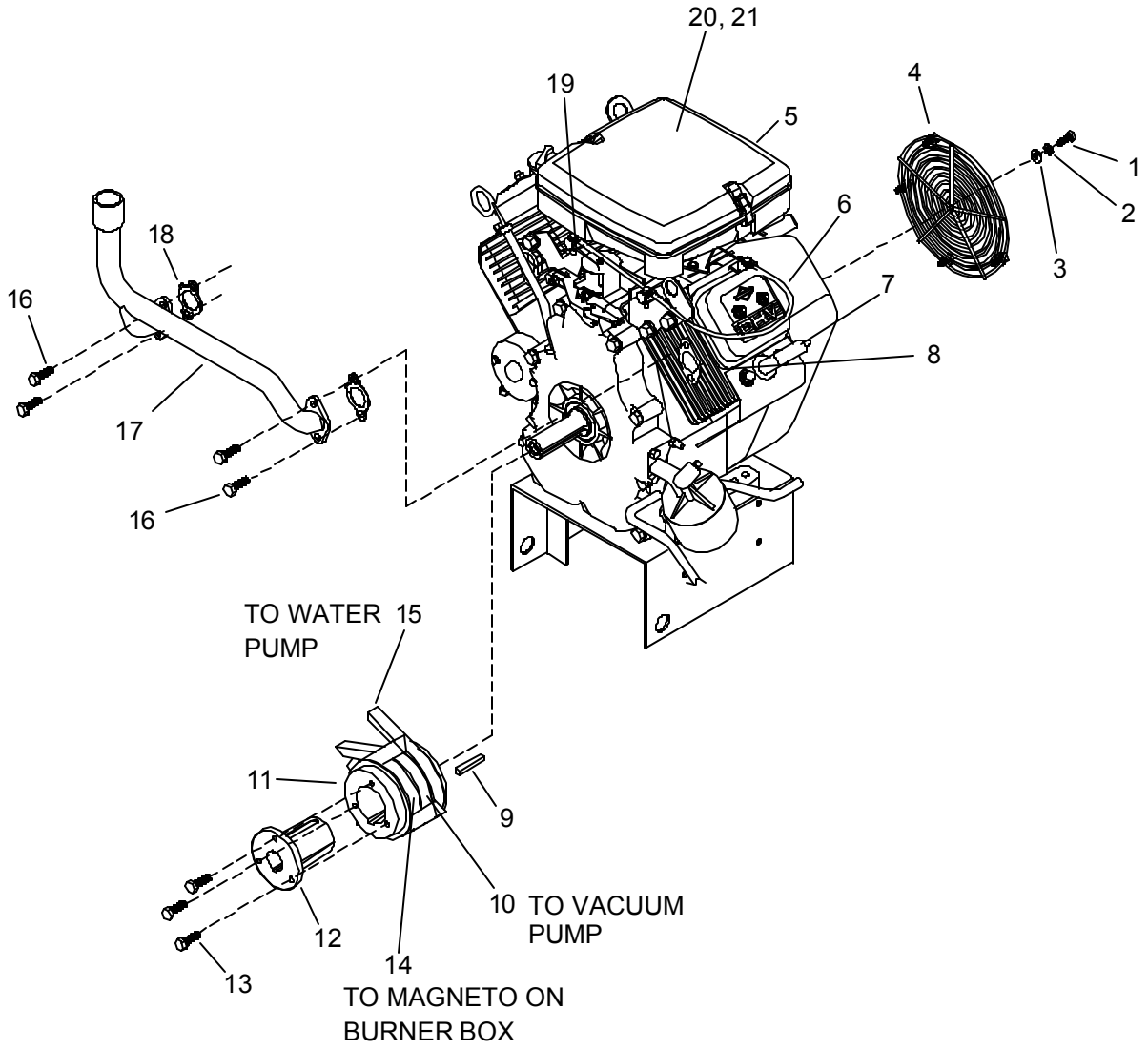
PROBLEM	CAUSE	SOLUTION
Burner will not light, with you unit running, controls ON, and ignition spark present, the burner fails to ignite.	Flow switch is not energized. The switch is energized when the wand valve is open.	Test, if necessary, replace.
	Defective, burner switch.	Test. If necessary, replace.
	Defective temperature control microswitch, causing the burner to stay OFF.	Test. If necessary, replace.
	Defective temperature control.	Test. If necessary, replace.
	Defective burner solenoid.	Replace could in solenoid or replace solenoid.
	Loose or broken wire, either the ground wire from the solenoid or the hot lead going from the master switch through the temperature control, burner switch, and micro to the solenoid.	Locate loose or broken wire and repair or replace.
Burner will not shut off, with your unit running, the burner will not shut off when the wand valve is closed.	Defective temperature control.	Test, if defective, replace.
	Defective burner solenoid.	Test, if defective, replace coil in solenoid or replace solenoid.
Burner ignition is radical. Each time that the burner ignites, the ignition is not smooth or quiet and smoke comes form the exhaust stack.	Burning improper fuel oil.	Drain and flush fuel tank. Refill tank with recommended oil. Refer to Fuel Requirements in the manual.
	Plugged oil burner nozzle.	Clean nozzle. **⚠ CAUTION:** Do NOT use wire to clean the orifice! Take the nozzle apart and use air pressure to remove blockage. If necessary, replace nozzle.
	Improper electrode setting.	Test, if defective, replace.
	Solenoid does not shut off completely, allowing oil to drip in combustion cone.	Test. If defective, replace.
	Improper spark from the magneto. The spark should be strong and continuous.	Repair magneto. If defective, replace.

NOTES:

CONTROL PANEL & FRAME



REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	56-502069G	BASE, OFTM, PROCHEM		
2	61-951618	CONTROL PANEL		COMPLETE
3	87162	WASHER, 1/4 SPLIT LOCK PLTD		
4	00-000210	SCR, 1/4-20 X 3/4" SOCHD		
5	00-000337	SCR, 10-32 X 1" SOCHD SST		
6	35-900182	CONTR, TEMP 275DEG F		
7	00-000065	SCR, 10-32 X 3/8" PNHD		
8	33-900163	BREAKER, CIRC 20A		
9	32-900205	SW, RTRY NON-ILLUM		
10	57030	NUT, 10-32 HEX NYLOCK		
11	49-802505	CABLE, THROTTLE		
12	32-900087	SWITCH, TOGGLE		
13	34-903000	HOUR METER		
14	18-808530	GA, WTR TEMP 320DEG BC		
15	49-802518	CABLE, CHOKE		
16	34-900099	LT, INDIC (DOME) RED		
17	32-900174	KEY SWITCH		
18	70105	SCR, 1/4-20 X 1.75 HHCS PLTD		
19	02-000066	FLATWASHER, 1/4		
20	57006	NUT, 1/4-20 HEX		
21	56-502245	TB, VAC INL BASE		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TO WATER PUMP
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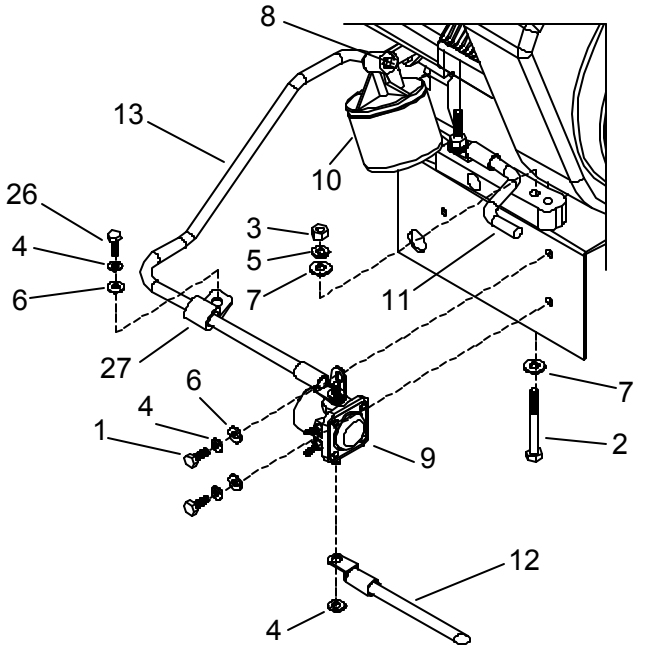
TO MAGNETO ON BURNER BOX

REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70260	SCR, M6 X 1 X 16MM HHCS		
2	87162	WASHER, 1/4 SPLIT LOCK PLTD		
3	02-000066	FLATWASHER, 1/4		
4	52-501757	SCREEN, ENG-VANGRD 738.0		
5	40-902147	ENG, B&S 18HP VTWIN OHV		
6	49-802518	CABLE, CHOKE		
7	42-902169	PLUG, SPARK		
8	42-902218	B&S BSKT, VLV, CVR#805028		
9	54-500412	KEY, 1/4 SQ X 1.88		
10	44-802319	BELT, BX46 GOODYEAR MATCH		
11	44-802109	PULL, 3TB36		
12	44-802126	HUB, P2X1”		
13	00-000340	SCR, MACH 5/16-18 X 1” BR8		
14	44-802146	BELT, AX30 GOODYEAR MATCH		
15	44-802237	BELT, AX42 GOODYEAR MATCH		
16	42-902353	B&S SCR, EXH MNFLD #805158		
17	56-502061	TUBE, ENG EXH SVP739		
18	42-902174	GASKET, EXHAUST MNFLD		
19	49-802505	CABLE, THROTTLE		
20	42-902005	B&S CARTRIDGE AIR CLNR 394-018		
21	42-902006	ELEMENT (OUTER), AIR CLEANER		
-	05-0088055	OIL, 30WT DET		NOT SHOWN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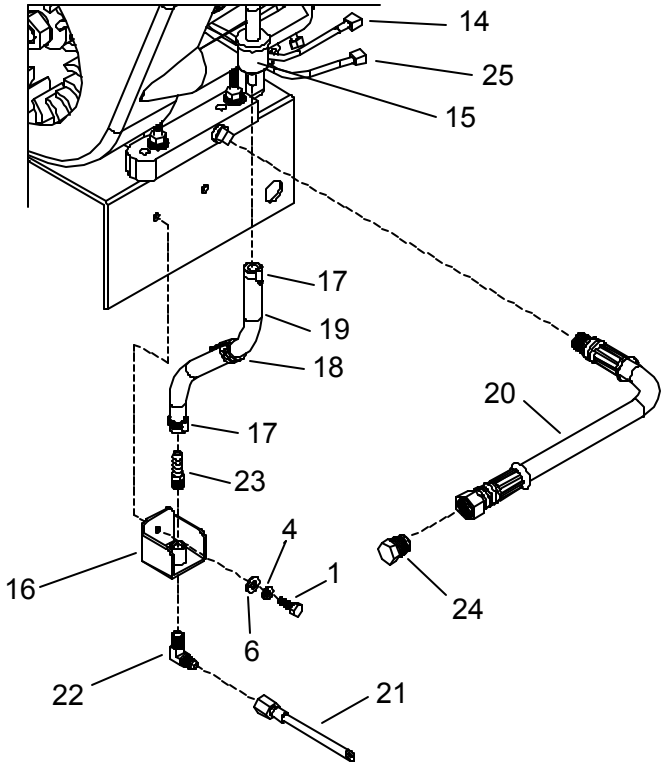
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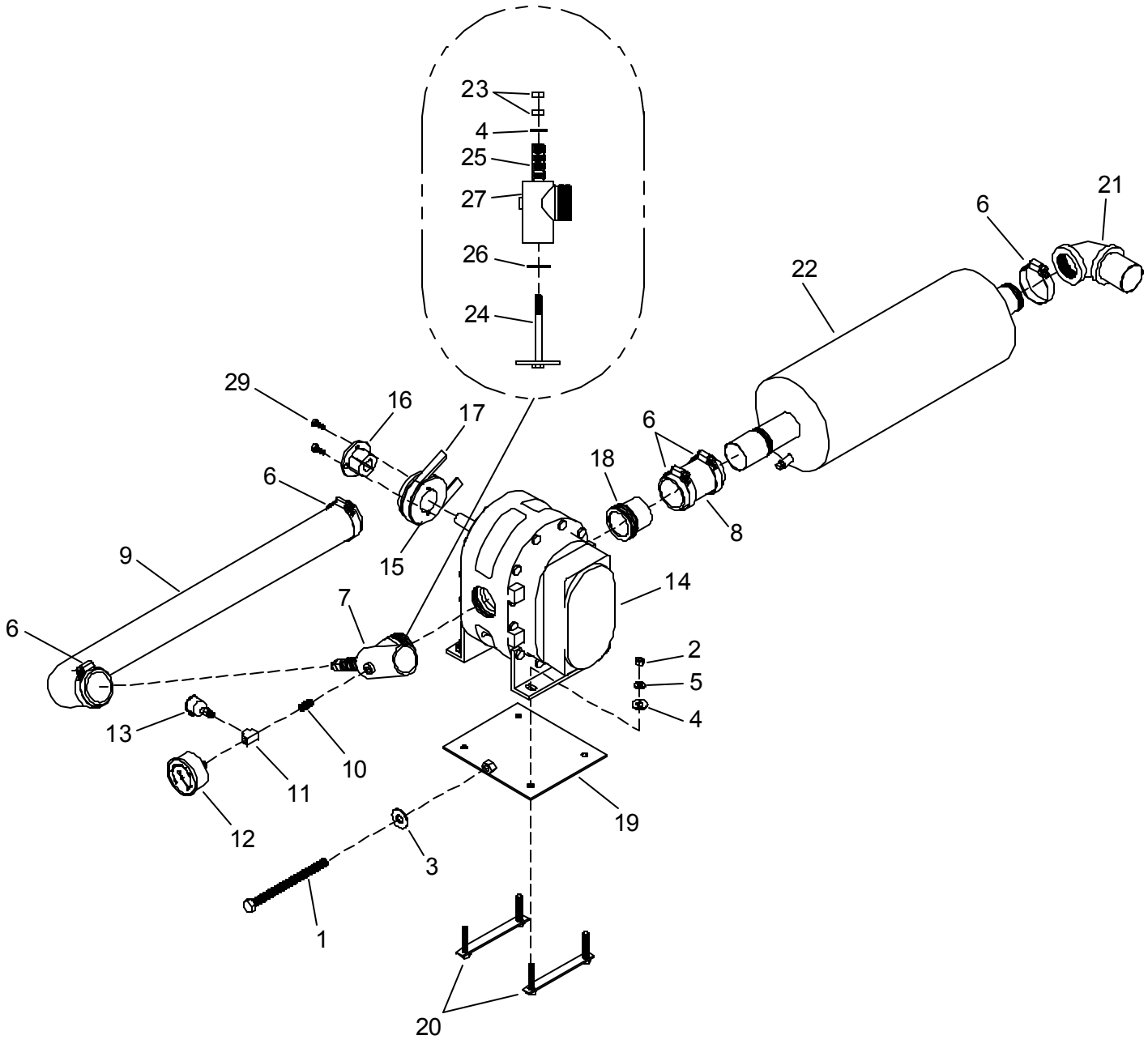
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70271	SCREW, 1/4-20 X 1/2 HHCS PLTD		
2	70320	SCR, 5/16-18 X 2" HHCS GR5PLTD		
3	57031	NUT, 5/16-18 HEX		
4	87162	WASHER, 1/4 SPLIT LOCK		
5	87083	WASHER, 5/16 SPLIT LOCK PLTD		
6	02-000066	FLATWASHER, 1/4		
7	02-000143	FLATWASHER, 5/16		
8	11-800101	PLUG, 1/8P		
9	35-901002	SOLENOID, STARTER		
10	42-902158	B&S OIL FILTER #492-932		
11	64-950498	CABL, BAT X 71" BLK		
12	64-950499	CABLE, BAT X 61" RED		
13	64-950434	CABLE, BATTERY X 29" RED		
14	31-900028	TERM, INS DSC 1/4M 14-16W		
15	42-902172	B&S FILTER, FUEL		
16	56-502065	BRKT, FUEL LINE		
17	03-000065	CLAMP, HOSE #4 SST		
18	03-000261	CLAMP, CABLE 1/2 ID 1/4BLT		
19	09-805447	HOSE, FUEL 1/4X9		
20	10-805037	HOSE, HP 3/8 X 15 (3/8PX1/2FT)		
21	10-805107	HOSE, 3/16 X 33-1/2 (1/4 FT BS)		
22	790605	ELL, 90 DEG 1/8 X 5/16 HB		
23	12-800041	FTTG, BARB 1/8P X 1/4H		
24	12-800062	PLUG, 1/2T		
25	31-900027	TERM, INS DSC 1/4F 14-16W		
26	00-000078	SCR, 1/4-20 X 1" HXHD GRD8		
27	80887	CLAMP, 7/8 DIA "P"		

VACUUM PUMP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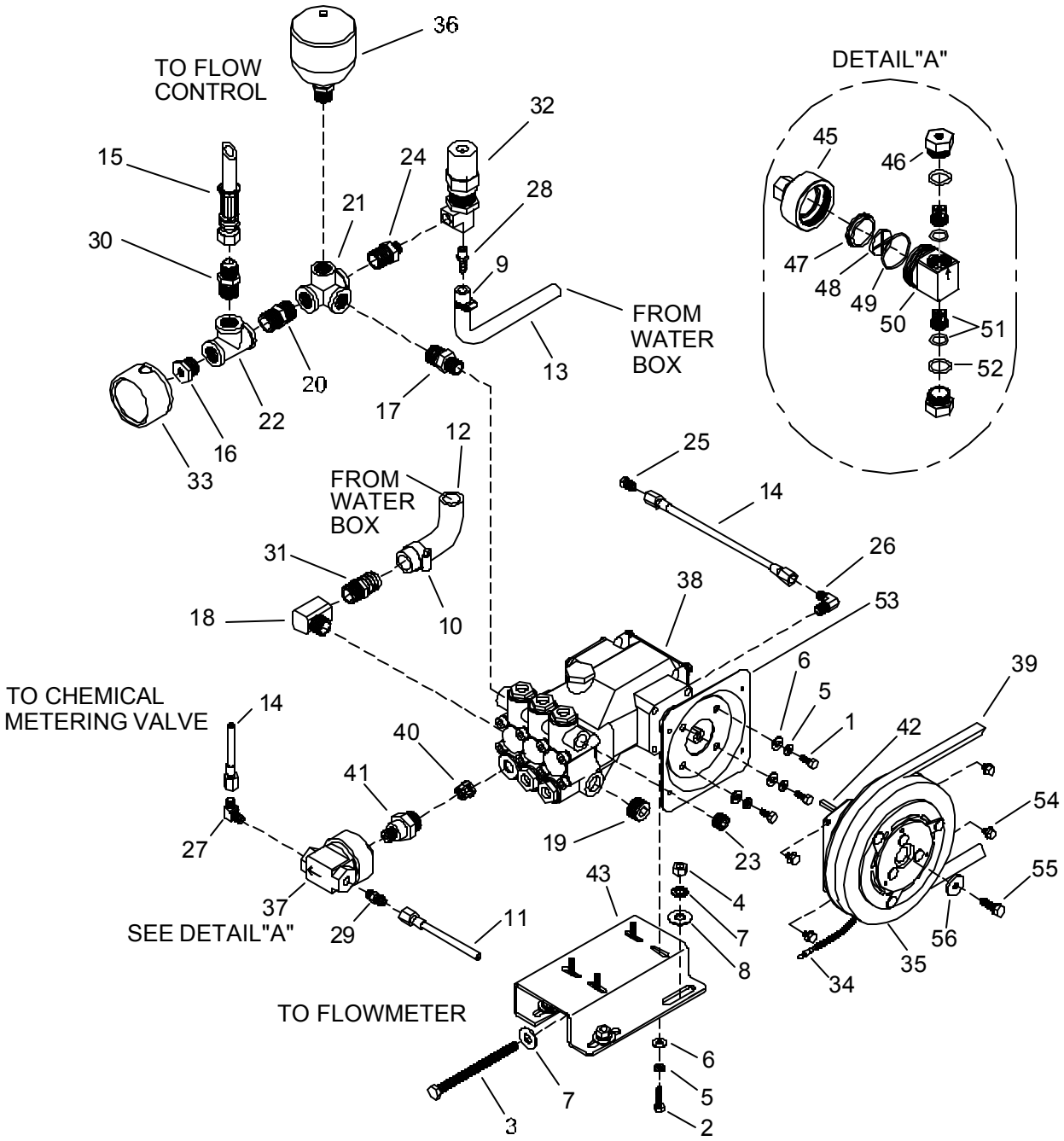
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	00-000138	SCR, VAC BELT TIGHTNER		
2	57111	NUT, 3/8-16 HEX		
3	02-000057	FLATWASHER, 1/2" HEAVY		
4	87171	WASHER, 3/8 FLAT		
5	87163	WASHER, 3/8 SPLIT LOCK		
6	03-000054	CLMP, HOSE #32 SST		
7	61-950471	ASSY, VAC REL VLV		
8	09-805150	HOSE, INT VAC 2.0 X 3.75 BLK		
9	09-805164	HOSE, INT VAC 2.0 X 80.0 BLK		
10	11-800022	WASHER, M6 SPLIT LOCK DIN127B		
11	11-800133	TEE, 1/8 BR		
12	18-808503	GA, VAC 30" HG 1/8P		
13	19-800075	CUP, OIL FILL 1/8P		
14	41-905012	PMP, VAC 3MP		
15	44-802120	PULL, BK32H		
16	44-802125	HUB, H3/4		
17	44-802319	BELT, BX46 GOODYEAR MATCH		
18	52-501607	FTTG, VAC OUTL CUB		
19	56-500505	PL, PMP ADJ		
20	56-500249	SLD, VAC MT-BASE		
21	56-500489	ELL, EXH HOSE ADPT		
22	61-950469	ASSY, VAC MFLR		
23	57114	NUT, 7/16-14 HEX		
24	56-501614	STM, VAC REL VLV #3VAC		
25	04-000091	SPRING, VAC REL VLV		
26	43-807073	DIAPH, VAC REL VLV		
27	52-501567	ELL, VAC REL VLV 100A, 150		
28	56-501614	STM, VAC REL VLV		
29	70800	SCR, 1/4-20 X 3/4 HXHD GR8 PLTD		
-	05-008039	OIL, AEON PD (28G24 SUTORBILT)		NOT SHOWN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FROM WATER BOX
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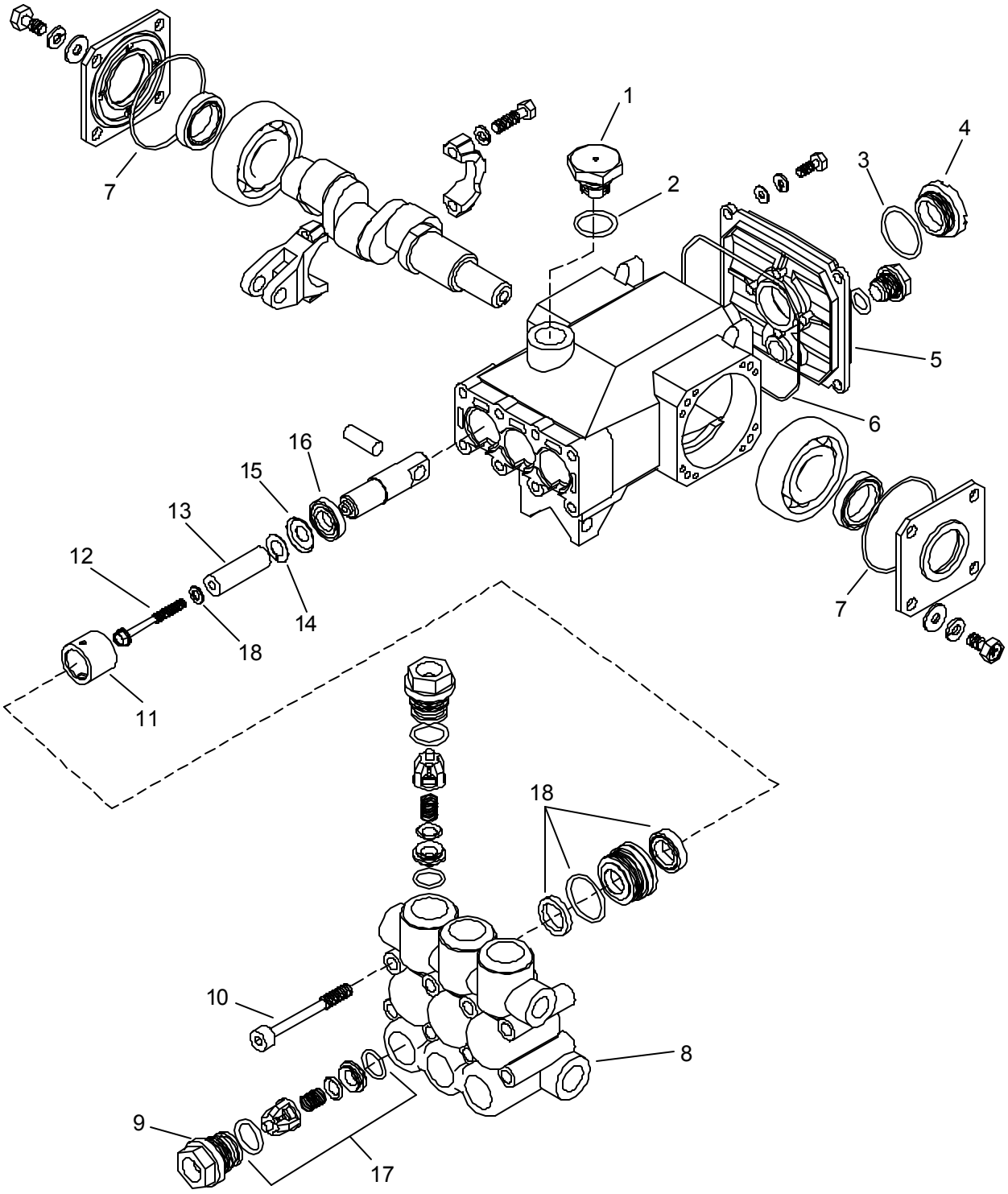
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70260	SCR, M6 X 1 X 16MM HHCS		
2	00-000277	SCR, MACH 6MM X 14MM		
3	00-000467	SCR, BELT TIGHTENER 3/8-1		
4	57111	NUT, 3/8-16 HEX		
5	87162	WASHER, 1/ SPLIT LOCK PLTD		
6	02-000066	WASHER, 1/4 FLAT		
7	87171	WASHER, 3/8 FLAT		
8	87163	WASHER, 3/8 SPLIT LOCK PLTD		
9	03-000254	CLAMP, HOSE #6 5/16 MIN 7/8 MAX		
10	03-000113	CLAMP, HOSE #12 SST		
11	10-805426	HOSE, 3/16 X 12 (1/4FT BS) MET		
12	09-805100	HOSE, WTR 3/4 X 13-1/2		
13	39311	HOSE, 3/8 RUBBER X 14”		
14	10-805000	HOSE, 3/16 X 9 (1/4FT BS) MET		
15	10-805375	HOSE, HP 3/8 X 17-3/4 (1/2FT)		
16	11-800020	BUSH, 1/2 X 1/4 BR		
17	11-800023	NIP, 1/2 X 3/8 HEX STL ZNC P		
18	11-800041	ELBOW, STREET 1/2 BR		
19	11-800069	PLUG, 1/2 SOCHD BR		
20	11-800086	NIP, 1/2 HEX BR		
21	11-800114	TEE, SIDE OUTLET 1/2 GALV		
22	11-800129	TEE, 1/2 GALV		
23	11-800224	PLUG, 3/8 SOCHD BR		
24	11-800382	NIP, 1/2 X 1/4 HEX SST		
25	12-800029	PLUG, 1/4T BR		
26	12-800031	ELBOW, 1/4P X 1/4T BR		
27	12-800040	ELBOW, 1/8P X 1/4T BR		
28	40014	HOSEBARB, 1/4MPT X 3/8 DL		
29	12-800065	CONN, 1/8P X 1/4T		
30	12-800141	CONN, 1/2P X 1/2T		
31	12-800278	FITTING, BRB 1/2P X 3/4H BR		
32	15-808081	REGULATOR, PRESS W/O INNER SPG		
33	18-808501	GAUGE, PRESS 1000PSI 1/4P		
34	31-900185	CONN, BULLET M (.156)		
35	790613	CLUTCH, ELEC. WATER PUMP 3CP		
36	790106	ACCUMULATOR, 250PSI CAT 6026		
37	41-809158	PUMP, CHEM TM (O-RING) SS		
38	41-809153	PUMP, WATER CAT 3CP1140		
39	44-802237	BELT, AX42 GOODYEAR MATCH		
40	52-809123	RETAIN, VALVE SPRING		
41	52-809125	ADAPTER, CAT CHEM PUMP		
42	48099	KEY, .20X.20X1.45, 3CP CAT		
43	56-502351	BRKT, PUMP ADJ CAT 3CP		
44	51386	LOOM, 7.125, HIGH TEMP, 1/4		
45	52-502053	CVR, CHEM, PMP		
46	52-502075	CAP, CHK VLV-HP CHEM PMP		
47	42-809047	DIAPHRAGM, CHEM PUMP		
48	42-809264	DISK, CHEM PUMP		
49	43-810105	O-RING, 1-5/8ID X 1-3/4OD VITON		
50	52-502052	BDY, CHEM PMP		
51	42-809265	CHECK VALVE, CHEM PUMP		
52	810079	O-RING, 7/8 ID X 1-1/16 OD		
53	790610	BRKT, CLTCH, WTR PMP, #34933		
54	140645	SCR, 1/4-20 X 3/8, SER FLNG		
55	140644	SCR, M8 X 25MM SHCS SS		
56	87240	WSHR, .328IDX1.00ODX.119, ZNC		
-	05-008016	OIL, CAT-WTR PMP		NOT SHOWN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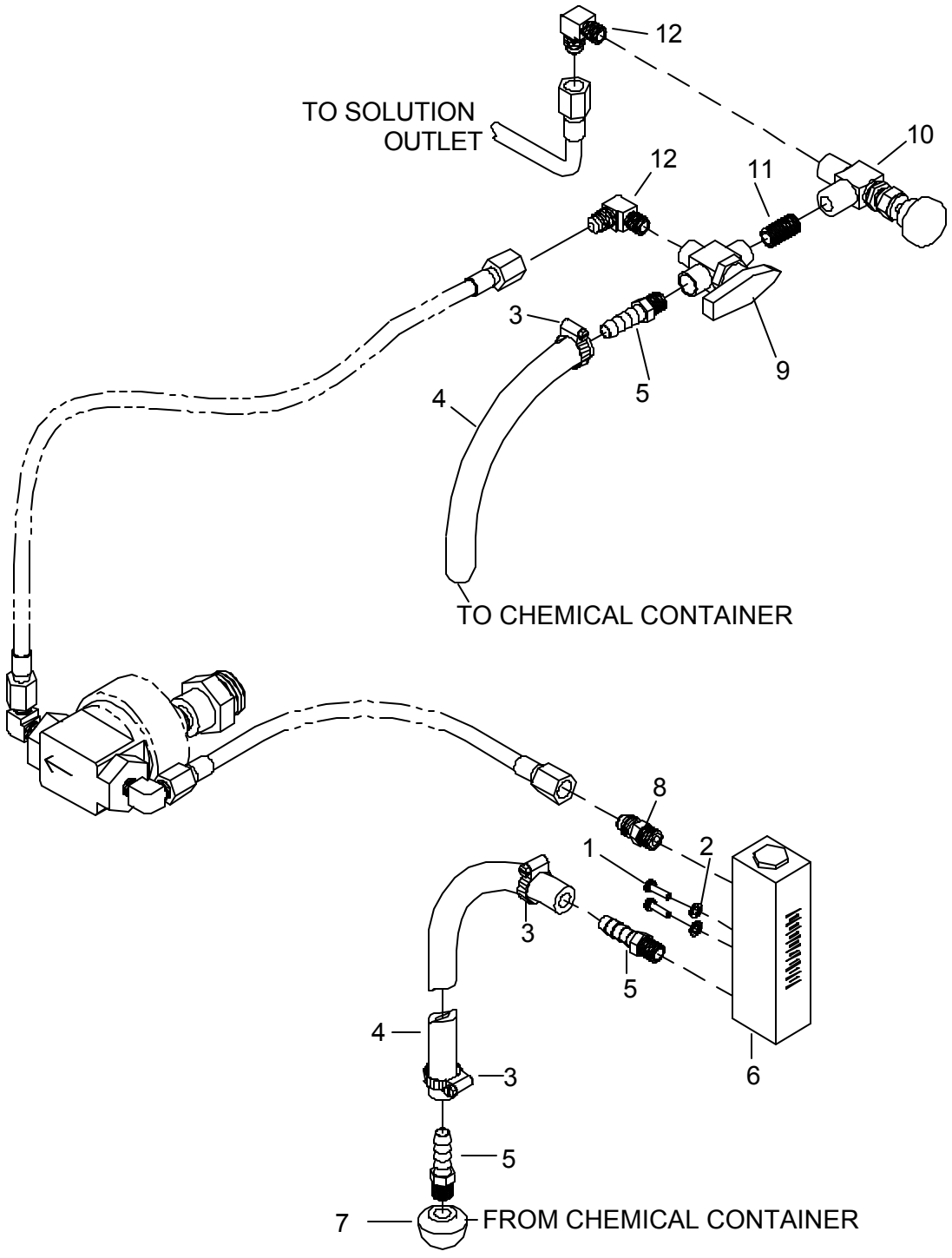
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	42-809238	CAP, OIL FILLER		
2	42-809239	O-RING, OIL FILL CAP		
3	43-807063	GASKET, OIL GAUGE		
4	42-902380	GAUGE, OIL LEVEL		
5	42-809401	COVER, CRANKCASE		
6	42-809402	O-RING, CRANK CVR		
7	42-809394	O-RING, BEARING CVR		
8	42-809403	MANIFOLD, HEAD		
9	42-809404	PLUG, VALVE		
10	42-809406	BOLT, MNFLD HD M8 X 65		
11	42-809405	RETAINER, SEAL		
12	42-809407	RETAINER, PNLGR W/STUD		
13	42-809408	PLUNGER		
14	42-809249	WASHER, KEYHOLE M18		
15	42-809381	SLINGER, BARRIER		
16	42-809409	SEAL, OIL CRANKCASE		
17	42-809410	KIT, SEAL		ORDER 1 EA. TO REPLACE ALL SEALS
18	66-950441	KIT, VLV		ORDER 1 EA. TO REPLACE ALL VALVES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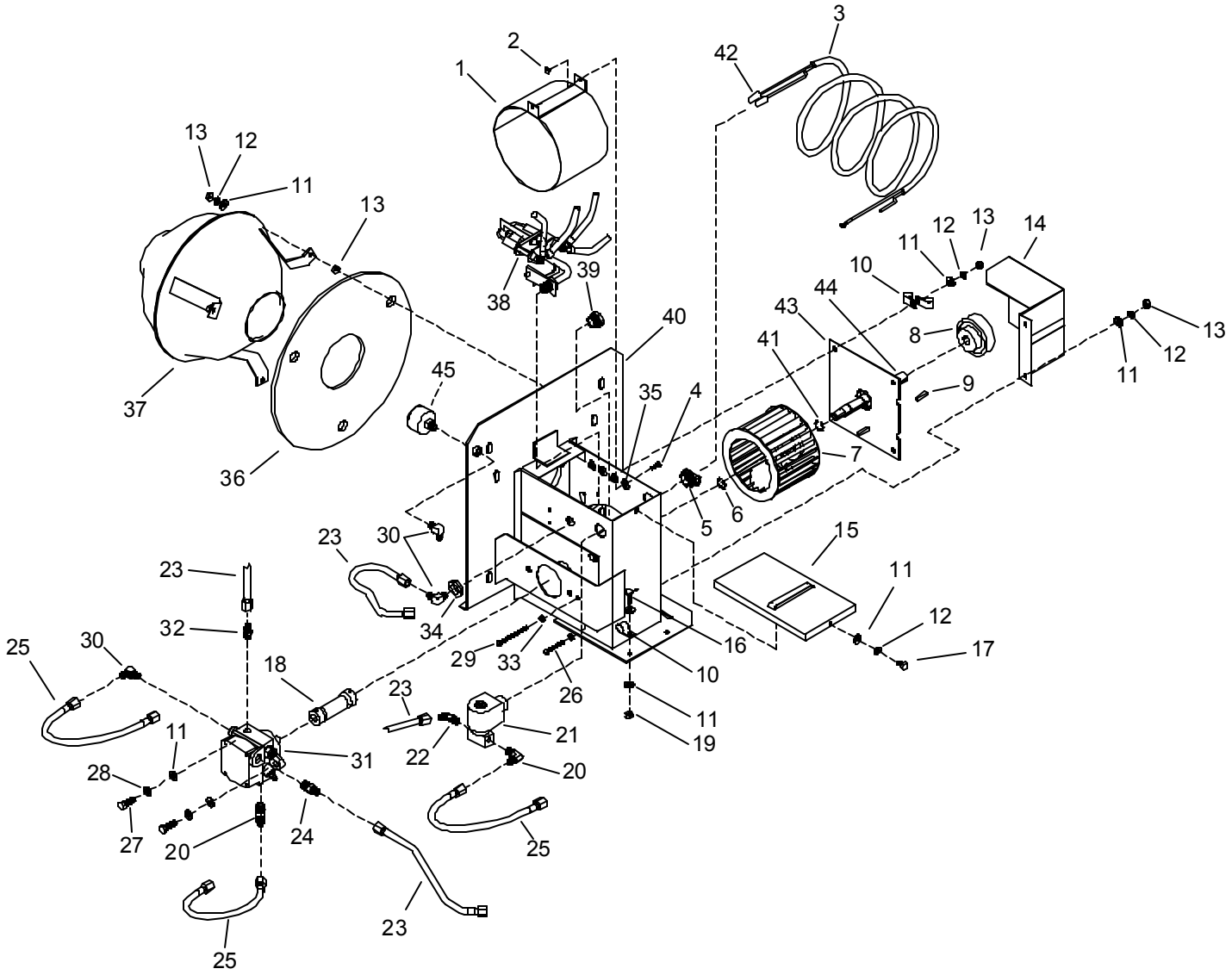
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	00-000065	SCR, 10-32 X 3/8" PNHD		
2	87165	WASHER, #10 SPLIT LOCK PLTD		
3	03-000065	CLAMP, HOSE #4 SPOTTER SST		
4	09-805099	HOSE, BRD 5/16 X 40		
5	12-800093	FTTG, BRB 1/8P X 5/16H		
6	18-808513	FLOWMETER 1/8FP		
7	14-806506	SCREEN, 1/8 FP		
8	12-800065	CONN, 1/8P X 1/4T		
9	15-808022	VALVE, 3-WAY BALL 1/8FP		
10	15-808106	VALVE, METER 1/8FP		
11	56032	NIPPLE, 1/8 CLOSE		
12	12-800065	CONN, 1/8P X 1/4T		

BURNER BOX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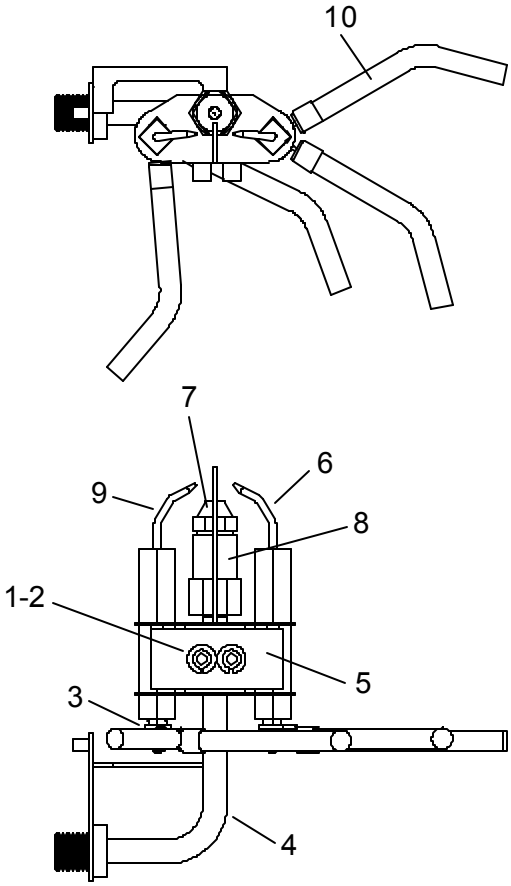
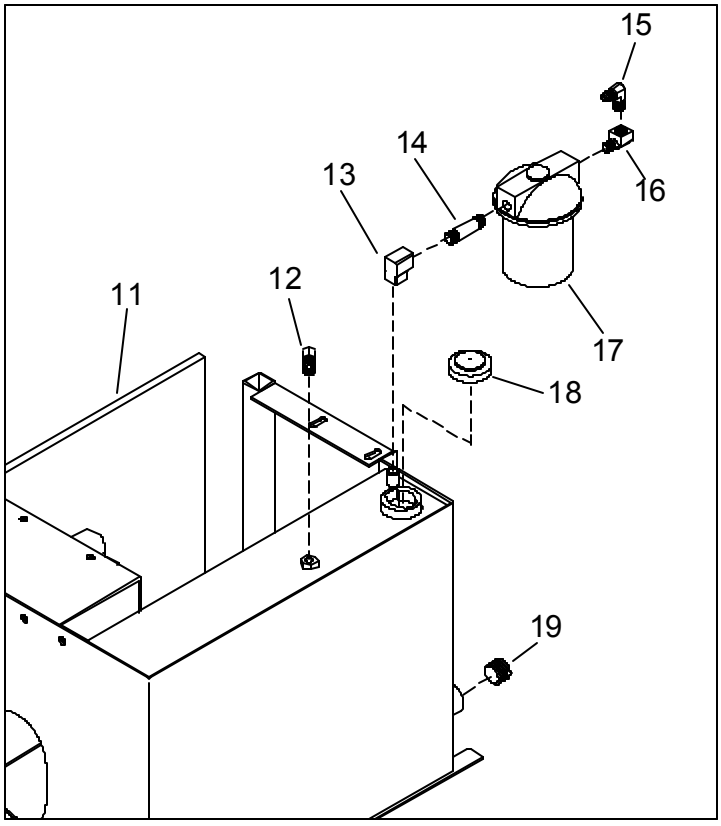
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	56-500199	ENCL, IMPLR-BRN BX 100A		
2	57026	NUT, 8-32 HEX NYLOCK SS		
3	30-900001	CD, 14-2 TUP SJ BLK		
4	70174	SCR, 8-32 X 5/8 PPHMS SS		
5	31-900017	CONN, CORD 1/2		
6	04-000155	RNG, EXT RETAIN 5/8-BRN B		
7	44-802137	IMPLR, BRN 5/8 100A, 150		
8	44-802136	PULL, AK26X5/8		
9	54-500680	KEY, 3/16 SQ X 7/8		
10	03-000051	CLMP, CABL 7/16ID 1/4BLT		
11	02-000066	FLATWASHER, 1/4		
12	87162	WASHER, 1/4 SPLIT LOCK PLTD		
13	57006	NUT, 1/4-20 HEX		
14	56-500194	GD, BLT-MAG 100A, 150		
15	50-500192	CVR, BRN BX 100A, 150		
16	00-000078	SCR, 1/4-20 X 1” HXHD GRD8		
17	70271	SCR, 1/4-20 X 1/2 HHCS PLTD		
18	44-802140	CPLG, FLX-BRN 100A, 150		
19	57045	NUT, 1/4-20 CS RIV		
20	12-800031	ELL, 1/4P X 1/4T BR		
21	35-901013	SOLEN, FUEL		
22	12-800261	ELL, 1/8P X 1/4T 45 DEG		
23	10-805000	HOSE, 3/16 X 9 (FT BS)		
24	12-800060	CONN, 1/4P X 1/4T BR		
25	10-805393	HOSE, 3/16 X 14-1/4		
26	00-000161	SCR, MACH 10-24X1-1/2 RDH		
27	70302	SCR, 5/16-18 X 1” HHCS GR 5 PLT NP		
28	87083	WASHER, 5/16 SPLIT LOCK PLTD		
29	00-000332	SCR, 10-24 X 2-1/2 RDH		
30	12-800040	ELL, 1/8P X 1/4T BR		
31	41-809055	PMP, FUEL		
32	12-800065	CONN, 1/8P X 1/4T		
33	57005	NUT, 10-24 HEX		
34	57097	NUT, 5/8-18 UNF HEX JAM PLTD		
35	43-807502	GROMMET, 3/8ID X 5/8OD		
36	47-700005	SHLD, BRN HT 100A, 150		
37	56-500665	CONE, BRN 100A, 150		
38	61-951690	ASSY, BURNER ELECTRODE W/GRD		SEE ELECTRODE PAGE FOR DETAILS
39	11-800070	NIP, 1/2 CHASE INS		
40	56-502545	BX, BRN 4 OUTLET MAG		
41	04-000154	RNG, INT RETAIN 30MM-BRN		
42	57069	NUT, ORG WIRE (2-5 18G/2-14G)		
43	56-500671	PL, BRN BRG 100A, 150		
44	52-500666	BRG, BRN & SHFT 100A, 150		

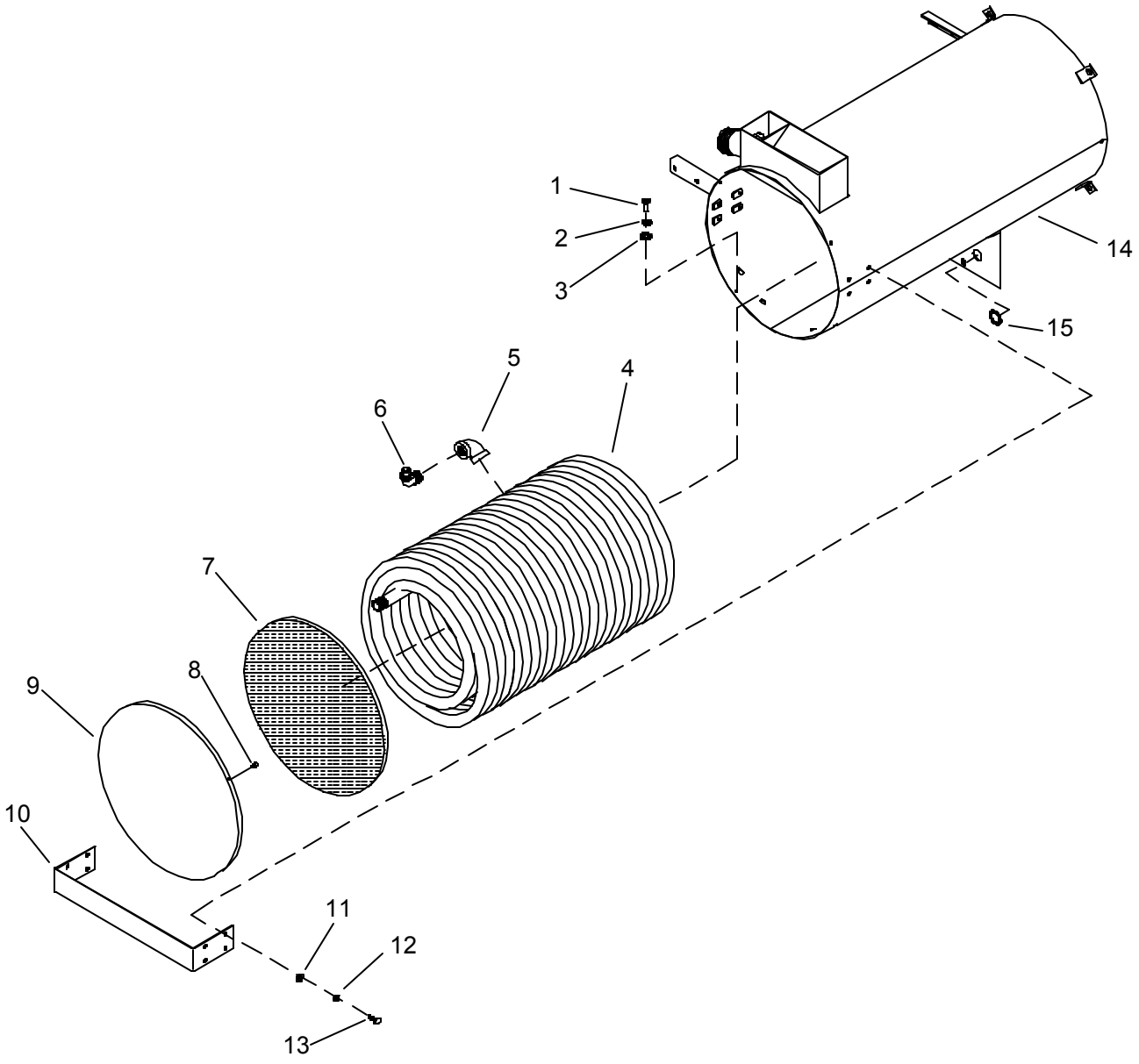
ELECTRODE & FUEL FILTER





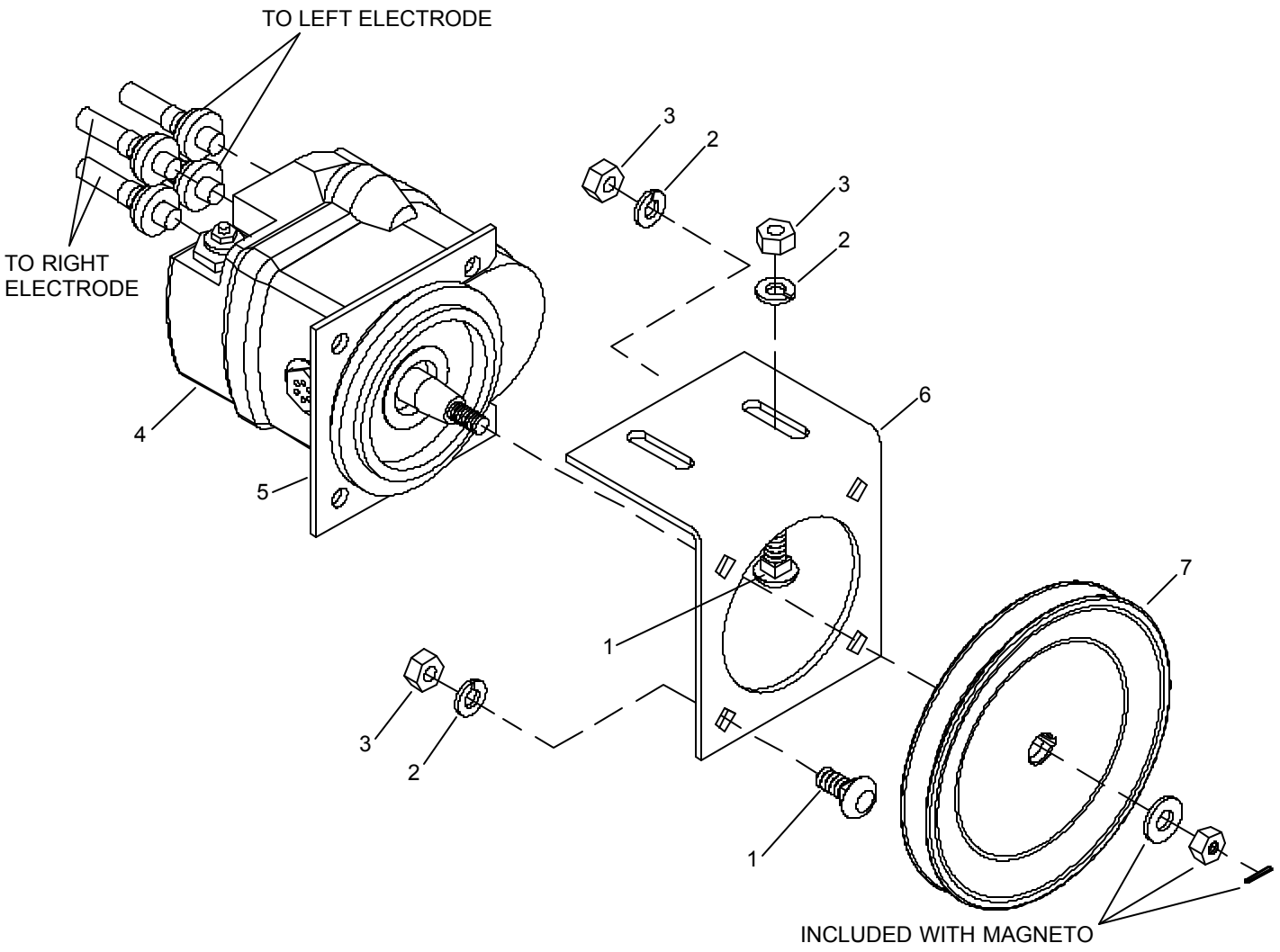
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	87165	WASHER, #10 SPLIT LOCK PLTD		
2	70497	SCR, #10-24 X 1/2 SHCS SS		
3	57012	NUT, 6-32 HEX		
4	56-502546	ASSY, BRN ELECTRODE 4 OUTLET		
5	50-500688	PL, ELECTROD HOLD DN 100A		
6	33-900083	ELECTROD, RT-BRN		
7	17-803019	NOZ, BRN 1.25GPH AR 100A		
8	17-803014	ADPT, NOZ SPRY FX1/8P BR		
9	33-900082	ELECTROD, L-BRN		
10	64-950100	WIRE, IGNITION OFTM		
11	47-700003	INS, BTM-HTR BX (V3) BIS		
12	12-800040	ELL, 1/8P X 1/4T BR		
13	31017	ELBOW, 1/4FPT X 1/4FPT		
14	11-800494	NIP, 1/4X2 SST		
15	12-800031	ELL, 1/4P X 1/4T BR		
16	31016	ELBOW, 1/4NPT STREET		
17	14-806520	FLTR, FUEL 1/4FP BS 100A		
18	49-802008	CAP, FUEL TNK OFTM 100A		
19	11-800069	PLUG, 1/2 SOCHD BR		

HEAT EXCHANGER



REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70302	SCR, 5/16-18 X 1" HHCS GR5 PLT		
2	87083	WASHER, 5/16 SPLIT LOCK PLTD		
3	02-000143	WASHER, 5/16 FLAT PLTD		
4	57-520010	COIL, W/MTS 100A, 150		
5	11-800011	ELL, 1/2 GALV		
6	12-8000171	ELL, 1/2P X 1/2T BR		
7	47-700004	INS, END PL 100A, 150		
8	00-000067	SCR, SLFDR #10 X 1/2 HXHD		
9	50-500693	PL, STK END 100A, 150		
10	50-501677	BRKT, COIL CSG 100A, 150		
11	02-000066	FLATWASHER, 1/4		
12	87162	WASHER, 1/4 SPLIT LOCK		
13	70270	SCR, 1/4-20 X 3/4 HHCS PLTD		
14	56-502377	BASE, COIL CSG 100A, 150		
15	43-807506	GROMM, 5/8 ID, 1.125 OD		

MAGNETO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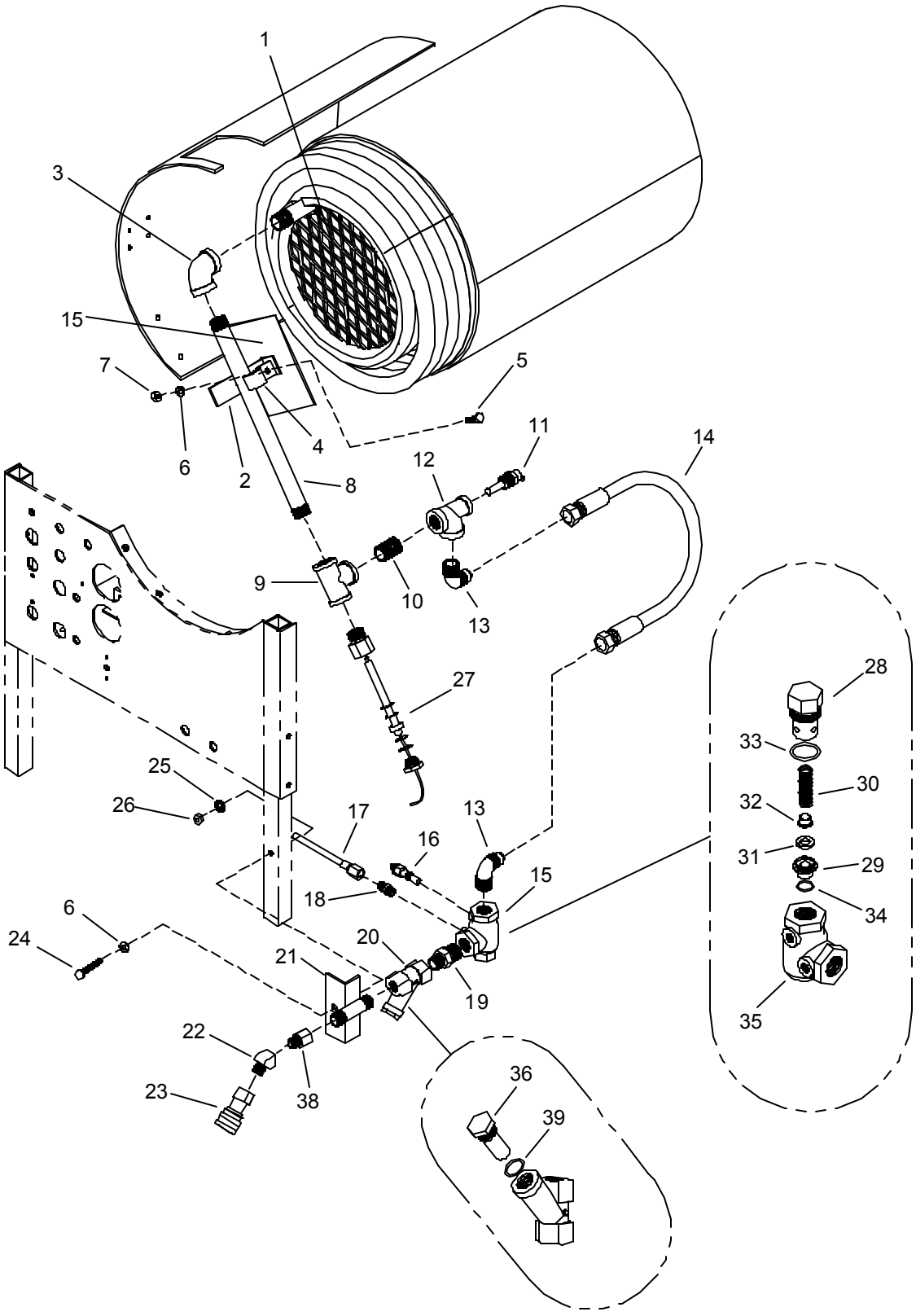
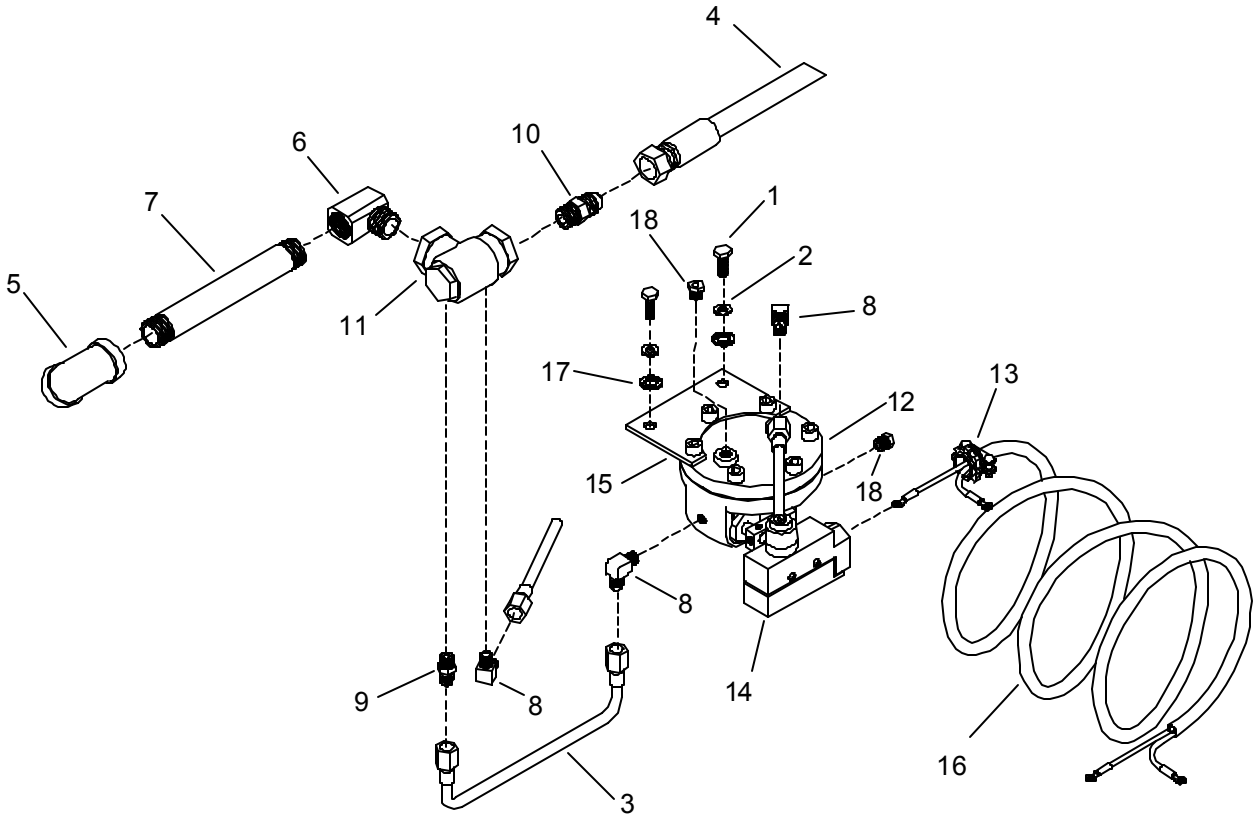
INCLUDED WITH MAGNETO

REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70593	SCR, 5/16-18 X 3/4 CARR GR5		
2	87083	WASHER, 5/16 SPLIT LOCK PLTD		
3	57031	NUT, 5/16-18 HEX		
4	36-900181	MAG, 4 OUTLET		
5	56-502544	CLMP, MAG INNER 4 OUTLET		
6	50-502159	BRKT, MAG HOLD DOWN 4 OUTLET		
7	52-502056	PULL, MAGNETO		

SOLUTION OUTLET



REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	47-700002	BDY, COIL 100A,150, 200		
2	56-500707	BDY, BFL RETAIN 100A, 150		
3	11-800011	ELL, 1/2 GALV		
4	03-000145	CLMP, PIP 1/2 SING HLD DN		
5	00-000078	SCR, 1/4-20 X 1” HXHD GRD8		
6	87162	WASHER, 1/4 SPLIT LOCK PLTD		
7	57006	NUT, 1/4-20 HEX		
8	11-800161	NIP, 1/2 X 11 GALV		
9	11-800129	TEE, 1/2 GALV		
10	11-800068	NIP, 1/2 X CL GALV		
11	35-900184	SENS, TEP 285 DEG		
12	11-800064	TEE, 1/2 X 3/8 X 1/2 GALV		
13	12-800171	ELL, 1/2P X 1/2T BR		
14	10-805375	HOSE, 3/8 X 20 (1/2FT BS)		
15	15-808151	VLV, 1/2 CHK		
16	34-903019	SENDER, TEMP 140-320DEG		
17	10-805000	HOSE, 3/16 X 9 (1/4FT BS) MET		
18	12-800065	CONN, 1/8P X 1/4T		
19	11-800023	NIP, 1/2 X 3/8 HX STL ZNC P		
20	14-806508	STRNR, Y 3/8FP BS		
21	56-500502	NIP, OUTL SUPT 100A, 150		
22	11-800027	ELL, ST 1/4 45 DEG.		
23	22015	COUPLER, 1/4 QD		
24	70105	SCR, 1/4-20 X 1.75 HHCS PLTD		
25	02-000066	FLATWASHER, 1/4		
26	57006	NUT,1/4-20 HEX		
27	12-800391	UNION, CAPILLARY-THERM		
28	16-808221	CAP, CHK VLV ASSY TM		
29	16-808223	SEAT CHK VLV ASSY TM		
30	16-808224	SPRING		
31	16-808225	TEFLON SEAT		
32	16-808226	POTTET CHK VLV ASSY		
33	43-810007	O-RING, 3/4 ID X 15/16 OD		
34	43-810008	O-RING		
35	16-808124	BDY, 1/2 DIFFR CHK VLV		
36	14-806523	SCREEN, Y-STRNR 3/8		
37	43-810002	O-RING, 5/8ID X 3/4OD		
38	11-800090	CONN, 3/8FP X 1/4P BR		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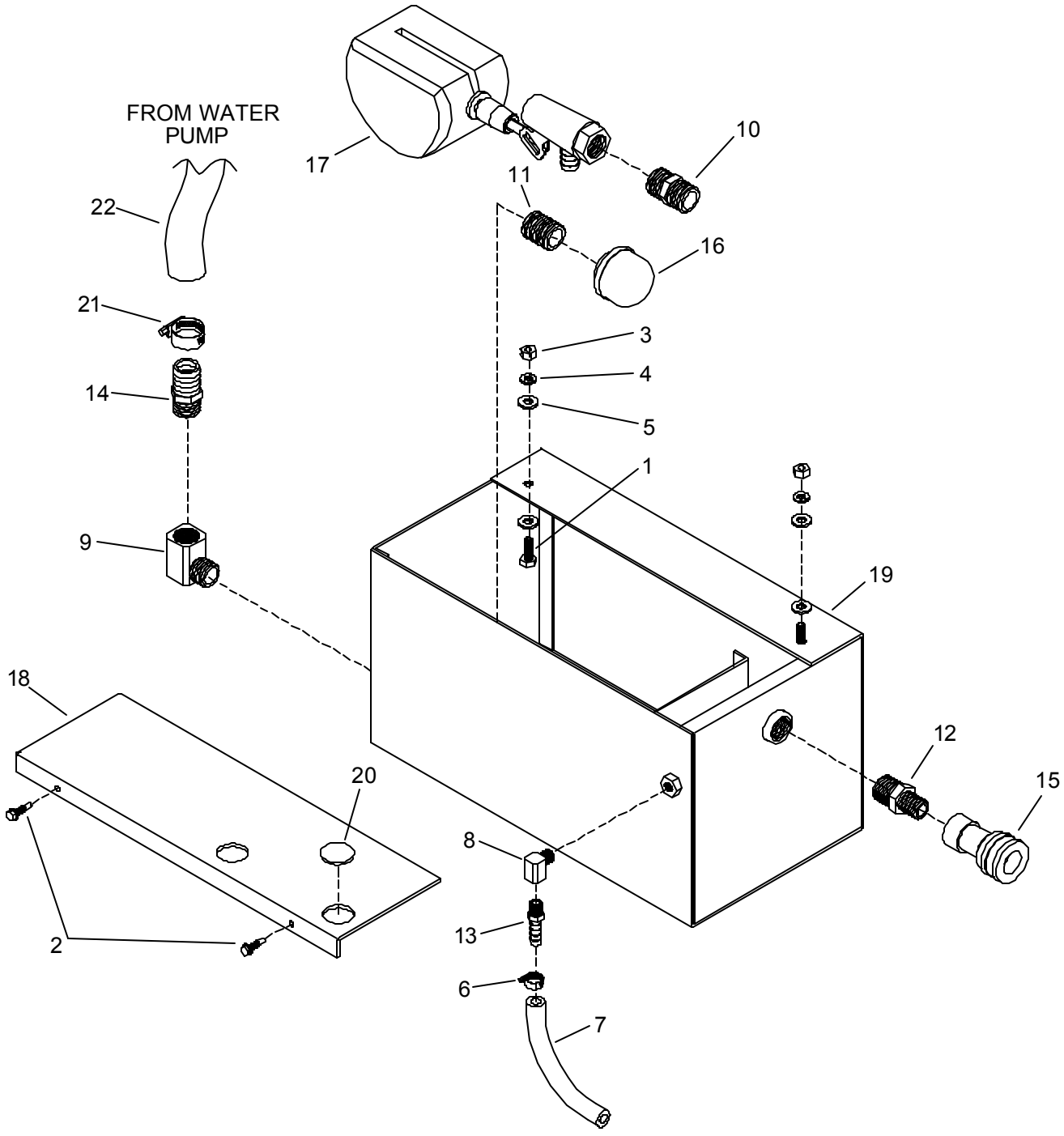
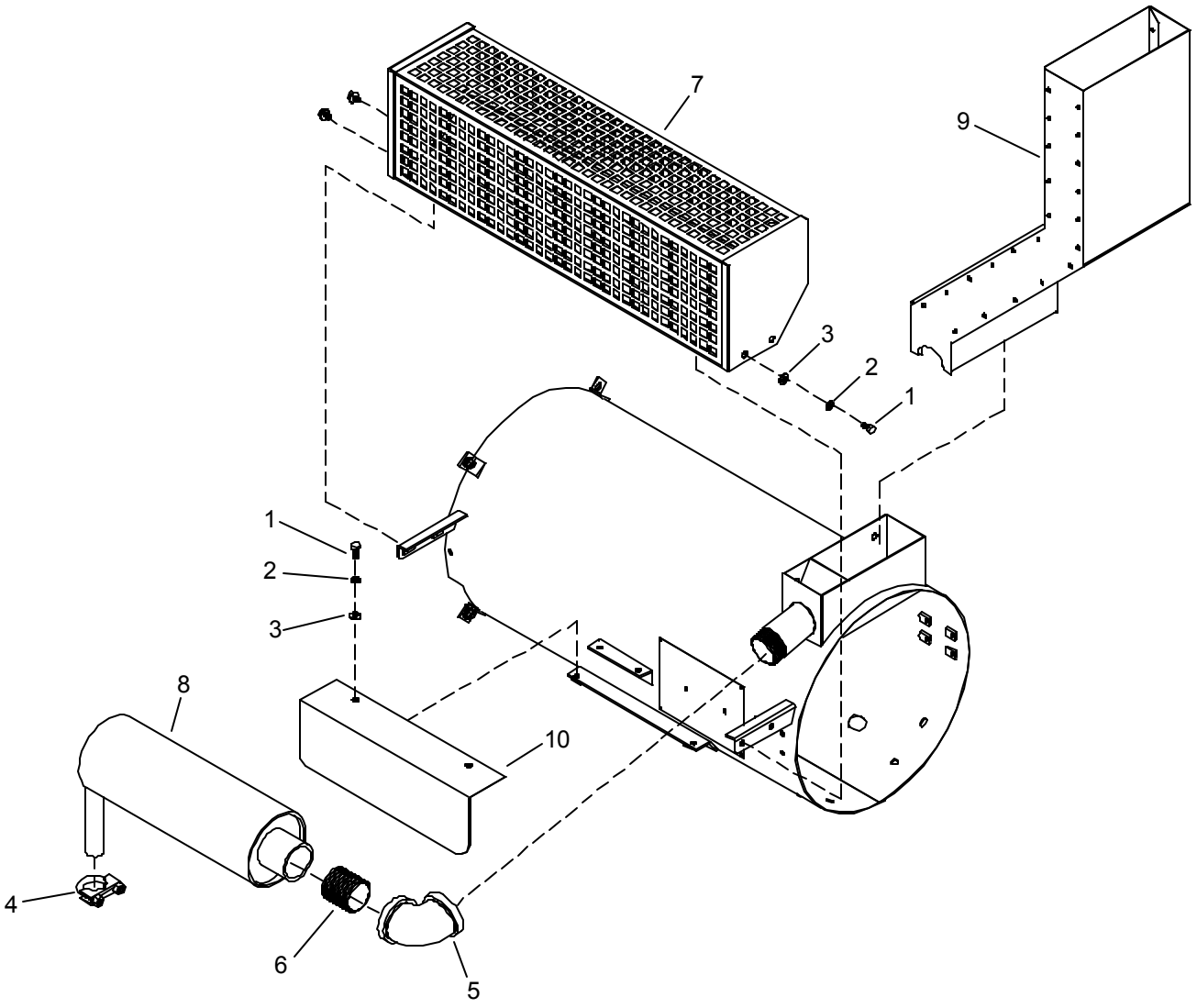
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70270	SCREW, CAP 1/4-20 x 3/4 HHCS PLTD		
2	87162	WASHER, 1/4 SPLIT LOCK		
3	10-805000	HOSE, 3/16 X 9 (1/4 FT BS) MET		
4	10-805375	HOSE, HP 3/8 X 20 (1/2FT BS)		
5	11-800011	HOSE, HP 3/8X 15 (3/8 X 1/2 FT)		
6	11-800041	ELL, STREET 1/2 BR		
7	11-800066	NIP, 1/2 X 6 GALV		
8	12-800040	ELL, 1/8P X 1/4T BR		
9	12-800065	CONN, 1/8P X 1/4T		
10	12-800141	CONN, 1/2P X 1/2T		
11	15-808027	VLV, 1/2 DIFFR CHK TM		
12	15-808042	CONTR, FLO 100A, 150		
13	31-900017	CONN, CORD 1/2		
14	35-901007	MICROSWITCH		
15	50-500501	PL, FLO CONTR MT 100A, 15		
16	64-950172	CD, FLO CONTR 150		
17	02-000066	FLATWASHER, 1/41		
18	11-800101	PLUG, 1/8P		

WATER BOX



REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70270	SCR, 1/4-20 X 3/4 HHCS PLTD		
2	00-000067	SCR, SLFDR #10 X 1/2 HXHD		
3	57006	NUT, 1/4-20 HEX		
4	87162	WASHER, 1/4 SPLIT LOCK PLTD		
5	02-000066	FLATWASHER, 1/4		
6	03-000065	CLAMP, HOSE #4 SST		
7	09-805099	HOSE, BRD 5/16 X 40		
8	11-800014	ELL, STREET 1/8 BR		
9	11-800041	ELL, STREET 1/2 BR		
10	11-800086	NIP, 1/2 HX BR		
11	11-800300	NIP, 1/2 X CL		
12	11-800354	NIP, 1/2 X 3/8 HEX BR		
13	12-800093	FTTG, BRB 1/8P X 5/16H		
14	12-800278	FTTG, BRB 1/2P X 3/4H BR		
15	13-806008	DSC, 3/8F X 3/8FP		
16	14-806540	STRAINER, SUC END 1/2FP		
17	15-808086	VLV, FLOAT 1/2FP 800A		
18	50-502019	LID, WTR BX OFTM, 100A, 150		
19	56-502314	BX, WTR OFTM, 100A, 150		
20	04-000237	CAP, PUSH ON		
21	03-000113	CLAMP, HOSE #12 SST		
22	09-805100	HOSE, WTR, 3/4 X 13-1/2		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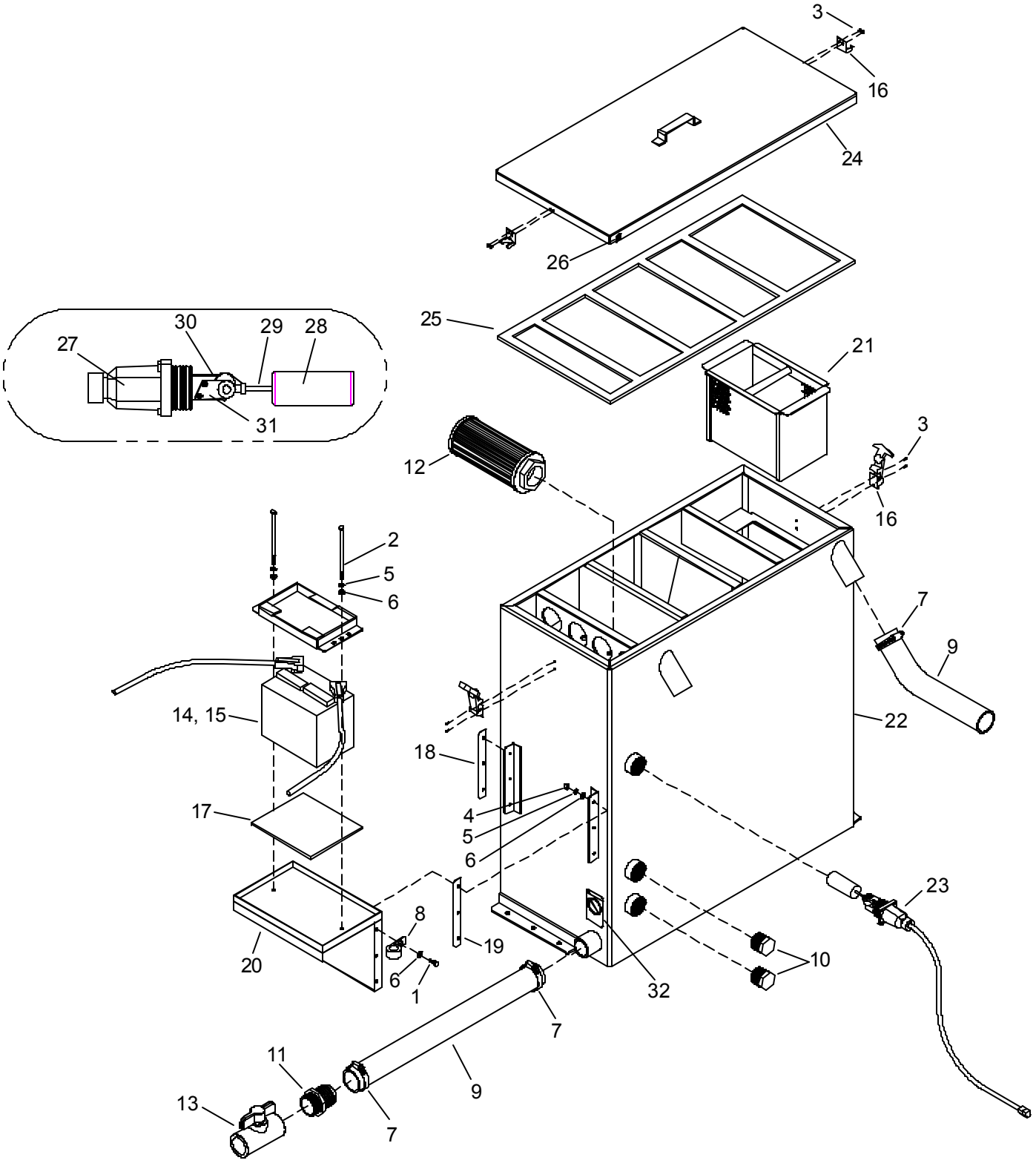
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70270	SCR, 3/8-16 X 2" HXHD		
2	87162	WASHER, 1/4 SPLIT LOCK PLTD		
3	02-000066	FLATWASHER, 1/4		
4	03-000140	CLMP, MFLR 1-1/8		
5	11-800012	ELL, 1-1/2 STL		
6	11-800067	NIP, 1-1/2 X CL GALV		
7	56-500191	GD, ENG MFLR 100, 150A		
8	57-520092	MFLR, EXH, OFTM		
9	56-500641	ADPT, STK OUTL 100A, 150		
10	50-501844	GD, BLT-WTR PMP		

WASTE TANK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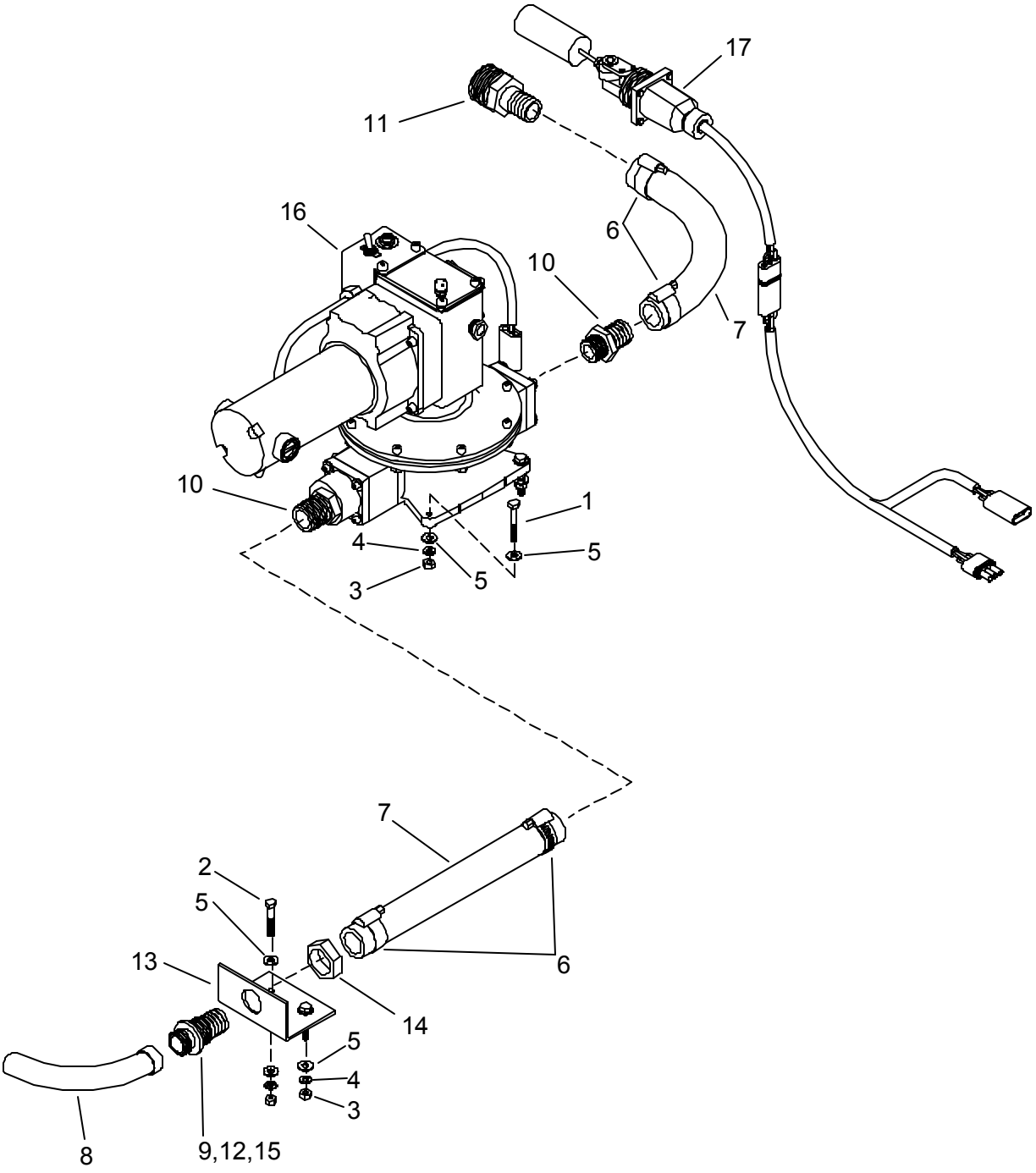
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70270	SCR, 1/4-20 X 3/4 HHCS PLTD		
2	00-000167	SCR, 1/4-20 X 6.5" HXHD		
3	00-000171	RIVET, 3/16 OD X 5/8 AL		
4	57006	NUT, 1/4-20 HEX		
5	87162	WASHER, 1/4 SPLIT LOCK PLTD		
6	02-000066	FLATWASHER, 1/4		
7	03-000054	CLAMP, HOSE #32 SST		
8	80887	CLAMP, 7/8 DIA "P" CUSHIONED		
9	09-805332	HOSE, 2.0 X 120.0 BLK		
10	11-800402	PLUG, 1-1/4 HXHD PVC		
11	12-800357	FTTG, BARB 1-1/2P X 2H		
12	14-806509	STRNR, WST TNK 2" 100 MESH		
13	15-808080	VALVE, BALL PVC 1-1/2FP		
14	31-900179	COVER, BATTERY TERMINAL		
15	36-900056	BATTERY		
16	46-802510	LATCH, DRAW 2-7/8 SST		
17	47-700007	SHIELD, BAT MT HT		
18	50-501697	SPACER, BAT SHLF MTG		
19	56-500188	COVER, BATTERY		
20	56-501779	TRAY, BATTERY		
21	56-501793	STRAINER BOWL		
22	56-502242	TNK, WST OFTM PROCHEM		
23	61-950621	ASSY, LVL SENS SHTOF SW		
24	61-951188	ASSY, LID WST TNK OFTM		
25	43-807103	BSKT, WST TNK LID		
26	48-941297	DECAL, ARROW-WST TNK LID		
27	33-900214	SWITCH, MIRCO		
28	33-900194	FLOAT		
29	33-900195	SHAFT, FLOAT		
30	33-900200	HOUSING, MAGNET		
31	33-900201	SUPPORT, PIVOT		
32	48-941327	DEC, WARNING-WST DMP		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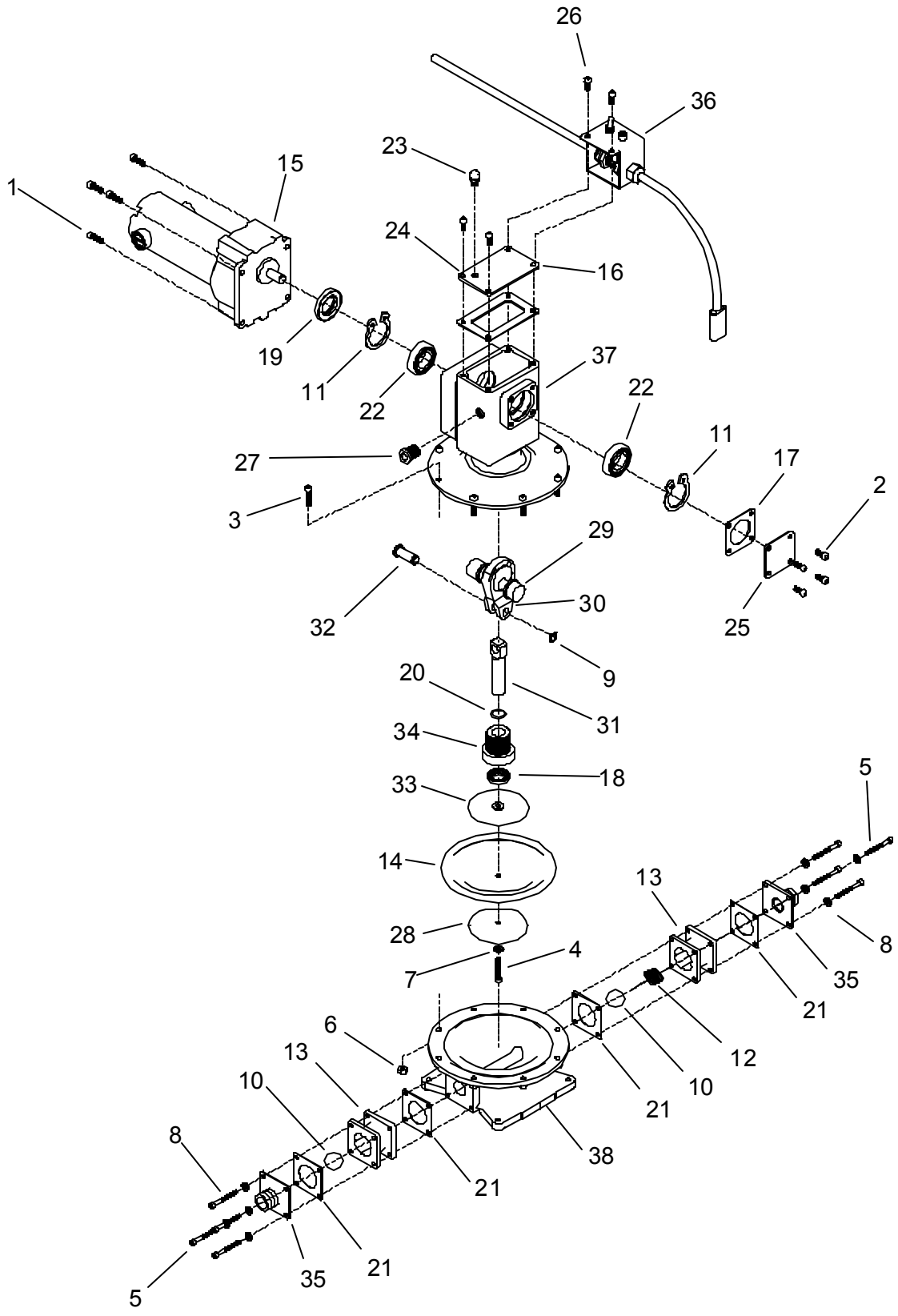
REF	PART NO.	QTY	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70105	4	SCR, M4 X 60 PH		
2	00-000132	2	SCR, 1/4-20 X 1/ 1/2 HXHD		
3	57006	4	NUT, 1/4-20 HEX		
4	87162	4	WASHER, 1/4 SPLIT LOCK PLTD		
5	02-000066	4	FLATWASHER, 1/4		
6	03-000176	4	CLAMP, HOSE #16		
7	09-805591	1	HOSE, WASTE PUMP 1” X 8’		
8	10-805484	1	HOSE, GARDEN 3/4 X 75’		
9	12-800052	1	CAP, HOSE 3/4 BR		
10	12-800367	1	FTTG, BRB 1PX1H BR		
11	12-800444	1	FTTG, 1-1/4P X 1” H BR		
12	43-807008	1	WASHER, HOSE 5/8 ID 1” OD		
13	50-502055	1	BRKT, CTR HOOD FR		
14	52-000123	1	NUT, 1-3/16-12 UN HXHD		
15	52-501993	1	CONN, HOSE WATER OUTL		
16	61-951306	1	PUMP, HD AUTO		
17	61-951319	1	ASSY, LVL SENS SHUT OFF SW		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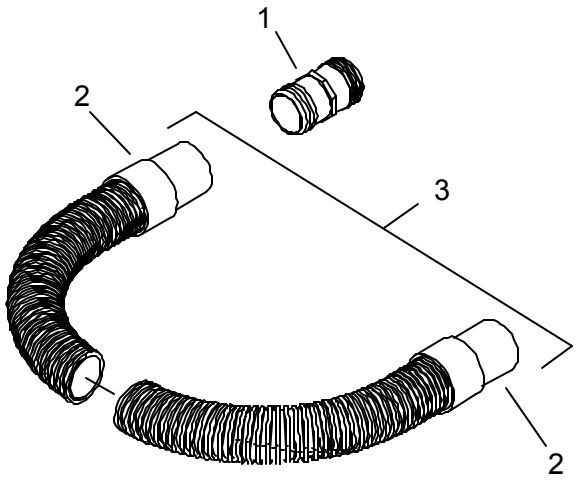
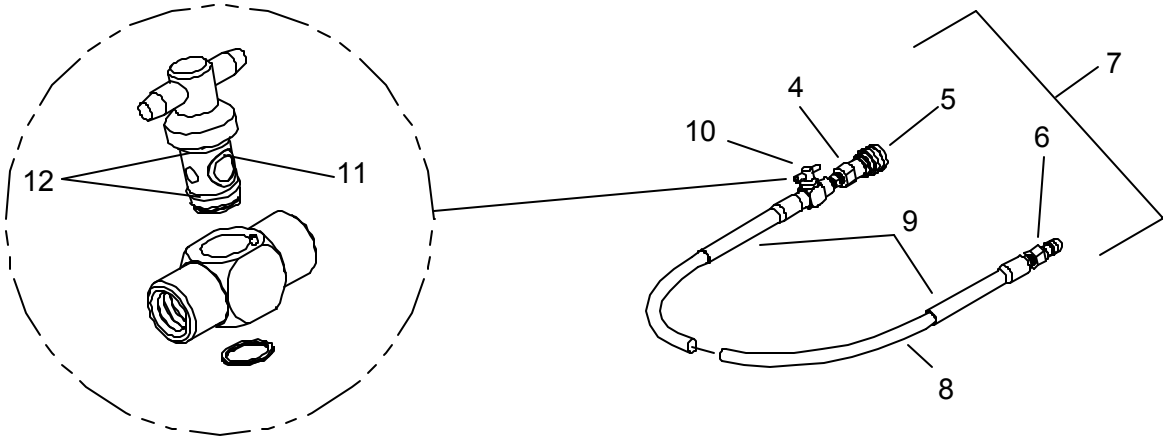
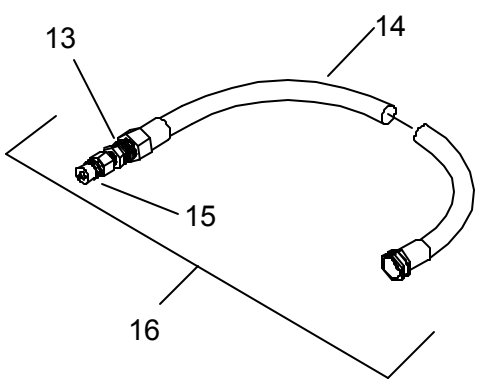
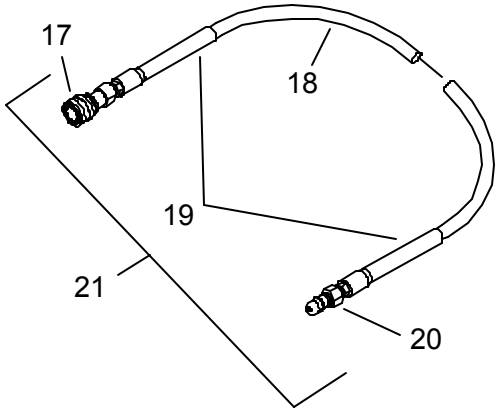
REF	PART NO.	QTY	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	00-000210	4	SCR, 1/4-20 X 3/4 SOCHD		
2	00-000311	4	SCR, 1/4-20 X 1/2 SHCS SS		
3	00-000312	8	SCR, CAP 1/4 X 1 SOCHD		
4	00-000399	1	SCR, CAP 1/4 X 1 3/8 SOC		
5	00-000241	8	SCR, CAP 10-32 X 2 SOCHD SS		
6	57245	8	NUT, 1/4-20 HEX NYLOCK SS		
7	87162	1	WASHER, 1/4 SPLIT LOCK		
8	87165	8	WASHER, #10 SPLIT LOCK		
9	04-000312	1	RING, RETAIN EXT 1/2		
10	04-000334	2	BALL, NYL ID		
11	04-000335	2	RING, SNAP 1-7/8D		
12	04-000342	1	SPRING, PUMP-OUT BALL PRESS		
13	52-501822	2	INL, HOSE CONN WST TNK		
14	16-808241	1	DIAPH, WST TNK PMP-OUT		
15	40-902151	1	MOTOR, 1/8HP 12V		
16	43-807117	1	GSKT, CVR TOP PMPOUT		
17	43-807118	1	GSKT, CVR SD PMPOUT		
18	43-810091	1	SEAL, PUMPOUT SHFT		
19	43-810100	1	SEAL PUMPOUT CAM		
20	43-810101	1	O-RING, 800/1000 .072		
21	43-807116	2	GSKT, IN/OUTLT WST TNK-PM		
22	45-801927	4	BRG, SHFT PUMP-OUT		
23	49-876301	1	VENT, UPR SHFT BRNG HSG		
24	50-502025	1	PL, CVR TOP PUMP-OUT		
25	50-502026	1	PL, CVR SD PUMP-OUT		
26	00-000311	2	SCR, 1/4-20 X 1/2 SHCS SS		
27	11-800504	1	GA, FLOW SIGHT 3/8 NPT		
28	52-501828	1	BTM, PLNGR WST TNK PMP-OUT		
29	52-501829	1	SHT, 3/4” STROKE WST TNK		
30	52-501914	1	RD, CONNECT WST PMP-OUT		
31	52-501915	1	GUIDE, PLNGR WST PUMP-OUT		
32	52-501921	1	PIN, WRIST PUMP-OUT		
33	52-501934	1	TOP, PLNGR PUMP-OUT		
34	52-501950	1	BUSH, THREADED		
35	52-501822	2	INL, HOSE CONN WST TNK		
36	56-502428	1	BRKT, PMP-OUT SW/CCT BRKR		
37	52-501821	1	TOP, WST TNK PUMP-OUT		
38	52-501820	1	BASE, WST TANK PMP-OUT		

HOSE ACCESSORIES



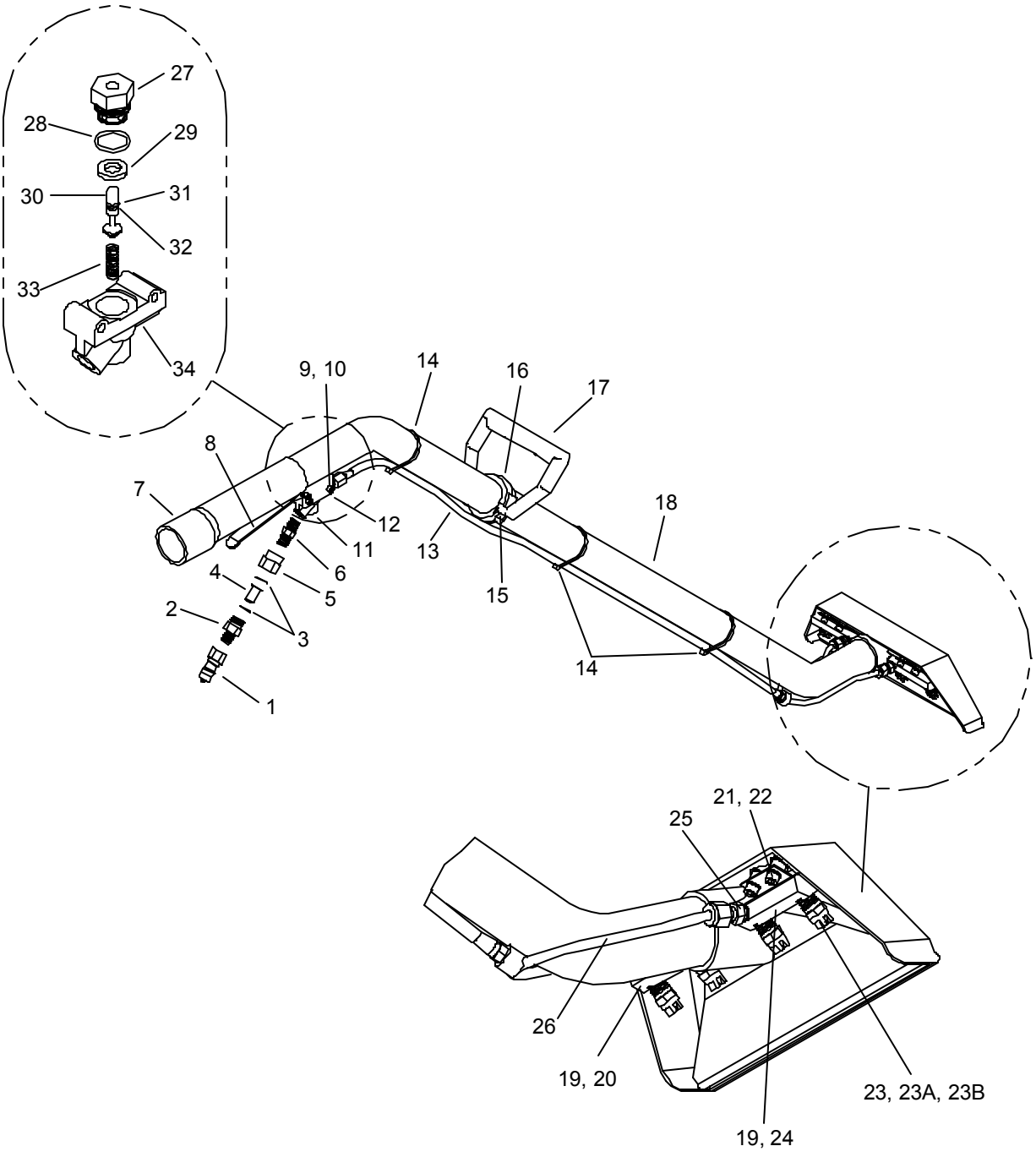






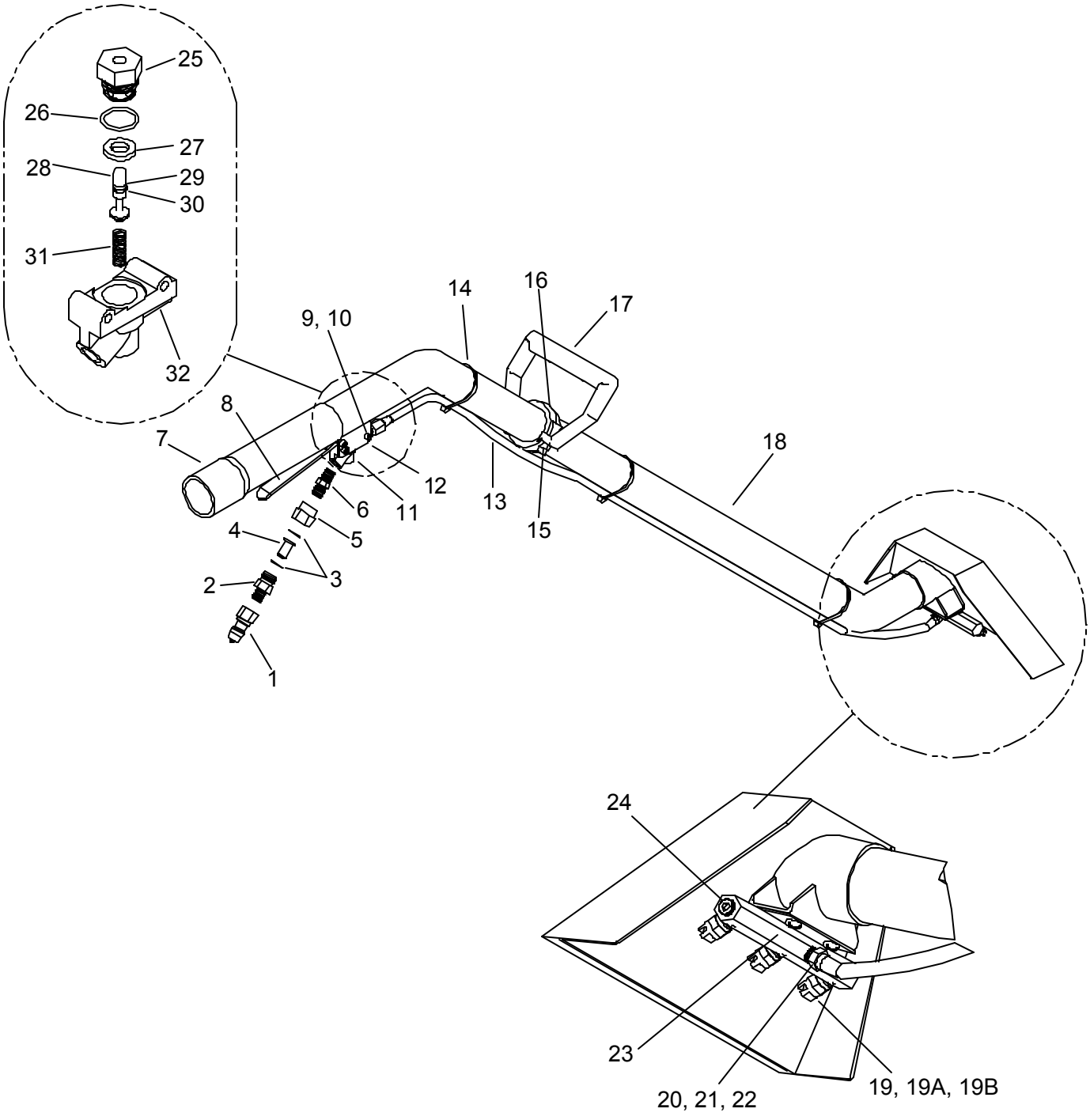
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	12-800078	FITTING, BRB 2H BS PVC		
2	08-805147	CUFF, 2”		
3	10-805060	HOSE, VAC 2”X50’ W/ CUFFS & HOSE		
4	56015	NIPPLE, 1/4 HEX		
5	22015	COUPLER, 1/4 QD		
6	56012	NIPPLE, 1/4 FPT QD		
7	10-805108	HOSE, HP 1/4 X 50FT W/QD & VLVE		
8	10-805077	HOSE, HP 1/4 X 50’		
9	08-805155	GUARD, HOSE VINYL		
10	15-808012	VALVE, BALL 1/4FP		
11	43-810014	O-RING, 7/32ID X 11/32OD		
12	43-810019	O-RING, 3/8 ID X 1/2 OD		
13	11-800354	NIP, 1/2 X 3/8 HEX BR		
14	10-805157	HOSE, WATER 1/2 X 50’		
15	13-806009	DISCONNECT 3/8M X 3/8FP		
16	10-805295	HOSE, WATER 1/2 X 50’		
17	22015	COUPLER, 1/4 QD		
18	10-805077	HOSE, HP 1/4 X 50’		
19	08-805155	GUARD, HOSE VINYL		
20	56012	NIPPLE, 1/4 FPT QD		
21	10-805122	HOSE, HP 1/4 X 50FT W/QD		

QUAD-JET WAND



REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
-	89238	WAND, TM, QJW (95015) PC		COMPLETE
-	89239	WAND, TM, QJW (9502) PC		COMPLETE
-	89237	WAND, TM QJW (9501) PC		COMPLETE
-	89235	WAND, TM, QJW, (9501) NO DECAL		COMPLETE
1	56012	NIPPLE, 1/4 FPT QD		
2	17-503010	CONN, 1/4P X 11/16-16M		
3	17-803006	WASHER, NYLON		
4	14-806512	STRAINER, JET 50 MESH		
5	17-803036	CONN, 1/4FP,11/16-16R BR		
6	56015	NIPPLE, 1/4 HEX		
7	09-805359	SLEEVE, WD HDL 9.5		
8	52-501619	TRIGGER, WD VLV		
9	00-000317	SCR, CAP 10-32X 1-1/4 SOCH		
10	57090	NUT, 10-32 HEX NYLOCK SS		
11	61-950496	ASSY, EXTRCTR VLV		
12	12-800060	CONN, 1/4P X 1/4T BR		
13	10-805387	HOSE, 3/16 X 43-1/2 (1/8P X 1/4)		
14	04-000053	TIE, CABLE 8” WHT		
15	00-000282	SCR, CAP 1/4-20 X 1-1/4 SOC		
16	52-501569	HOLD DOWN, WD HDL		
17	52-501568	BODY, WD HDL		
18	56-501940	WAND & HEAD, CAST SST		
19	11-800206	PLUG, 1/8 SOCHD BR		
20	56-501966	ASSY, L S-BEND MNFLD		
21	00-000347	SCR, CAP 10-24 X1/4 SOCHD		
22	87165	WASHER, #10 SPLIT LOCK		
23	17-803001	TIP, SPRY 95015X1/8P SST		89238
23A	17-803002	TIP, SPRY 9502X1/8P SST		89239
23B	17-803018	TIP, SPRY 9501X1/8P SST		89237 89235 (NO DECAL)
24	56-501986	ASSY, RT S-BEND MNFLD		
25	12-800322	CONN, 1/8PX1/4T COMP BR		
26	56-501967	ASSY, S-BEND MNFLD		
27	16-808229	HOLDER, VLV STEM-EXTRCTR VL		
28	43-810063	O-RING, .551 ID .691 OD		
29	16-808228	SEAT, EXTRCTR VLV		
30	16-808189	STEM, EXTRCTR VLV		
31	43-810064	BACK-UP, .250 DIA		
32	43-810062	O-RING, .144 ID .254 OD		
33	16-808190	SPRING, EXTRCTR VLV		
34	52-501590	BODY, EXTRCTR VLV		
-	48-941186	DECAL, WD HD (CAST SS)		NOT SHOWN
-	66-808169	KIT, REP-WD VLV		NOT SHOWN INCLUDES PARTS 27-29 & 31-33

TRI-JET WAND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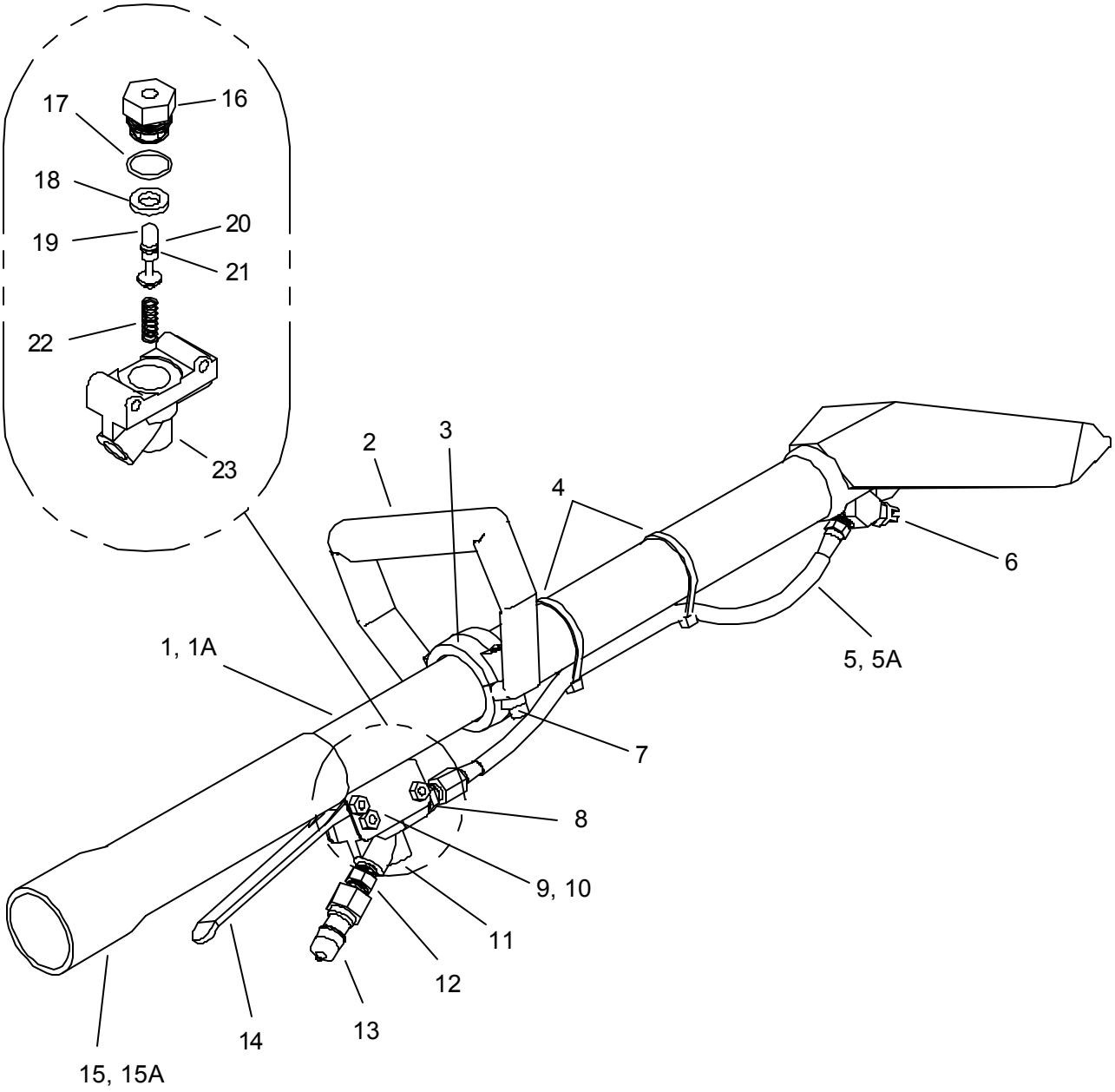
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
-	89233	WAND, TJW (9502) PC		COMPLETE
-	89232	WAND, TJW, (95015) CUBXL		COMPLETE
-	89234	WAND, TJW, (9503) PC		COMPLETE
1	56012	NIPPLE, 1/4 FPT QD		
2	17-503010	CONN, 1/4P X 11/16-16M		
3	17-803006	WASHER, NYLON		
4	14-806512	STRAINER, JET 50MESH		
5	17-803036	CONN, 1/4FP,11/16-16R BR		
6	56015	NIPPLE, 1/4 HEX		
7	09-805359	SLEEVE, WD HDL 9.5		
8	52-501619	TRIGGER, WD VLV		
9	00-000317	SCR, CAP 10-32X 1-1/4 SOCH		
10	57090	NUT, 10-32 HEX NYLOCK SS		
11	61-950496	ASSY, EXTRCTR VLV		
12	12-800060	CONN, 1/4P X 1/4T BR		
13	10-805253	HOSE, 3/16X49 (1/8P X 1/4FT)		
14	04-000053	TIE, CABLE 8” WHT		
15	00-000282	SCR, CAP 1/4-20 X 1-1/4 SOC		
16	52-501569	HOLD DOWN, WD HDL		
17	52-501568	BODY, WD HDL		
18	56-501712	WAND & HEAD, TRI-JET WD		
19	17-803002	TIP, SPRY 9502X1/8P SST		89233
19A	17-803001	TIP, SPRY 9501X1/8P SST		89232
19B	17-803046	TIP, SPRY 9503X1/8P SST		89234
20	70162	SCR, 10-32 X 3/8 PPHMS SS		
21	87165	WASHER, #10 SPLIT LOCK		
22	57014	NUT, 10-32 HEX SS		
23	56-501739	MANIFOLD, WD TRI-JET		
24	11-800206	PLUG, 1/8 SOCHD BR		
25	16-808229	HOLDER, VLV STEM-EXTRCTR VL		
26	43-810063	O-RING, .551 ID .691 OD		
27	16-808228	SEAT, EXTRCTR VLV		
28	16-808189	STEM, EXTRCT VLV		
29	43-810064	BACK-UP, .250DIA		
30	43-810062	O-RING, .114ID .254OD		
31	16-808190	SPRING, EXTRCTR VLV		
32	52-501590	BODY, EXTRCTR VLV		
-	48-941166	DECAL, WD HD		NOT SHOWN
-	66-808169	KIT, REP-WD VLV		NOT SHOWN INCLUDES PARTS 25-27 & 29-31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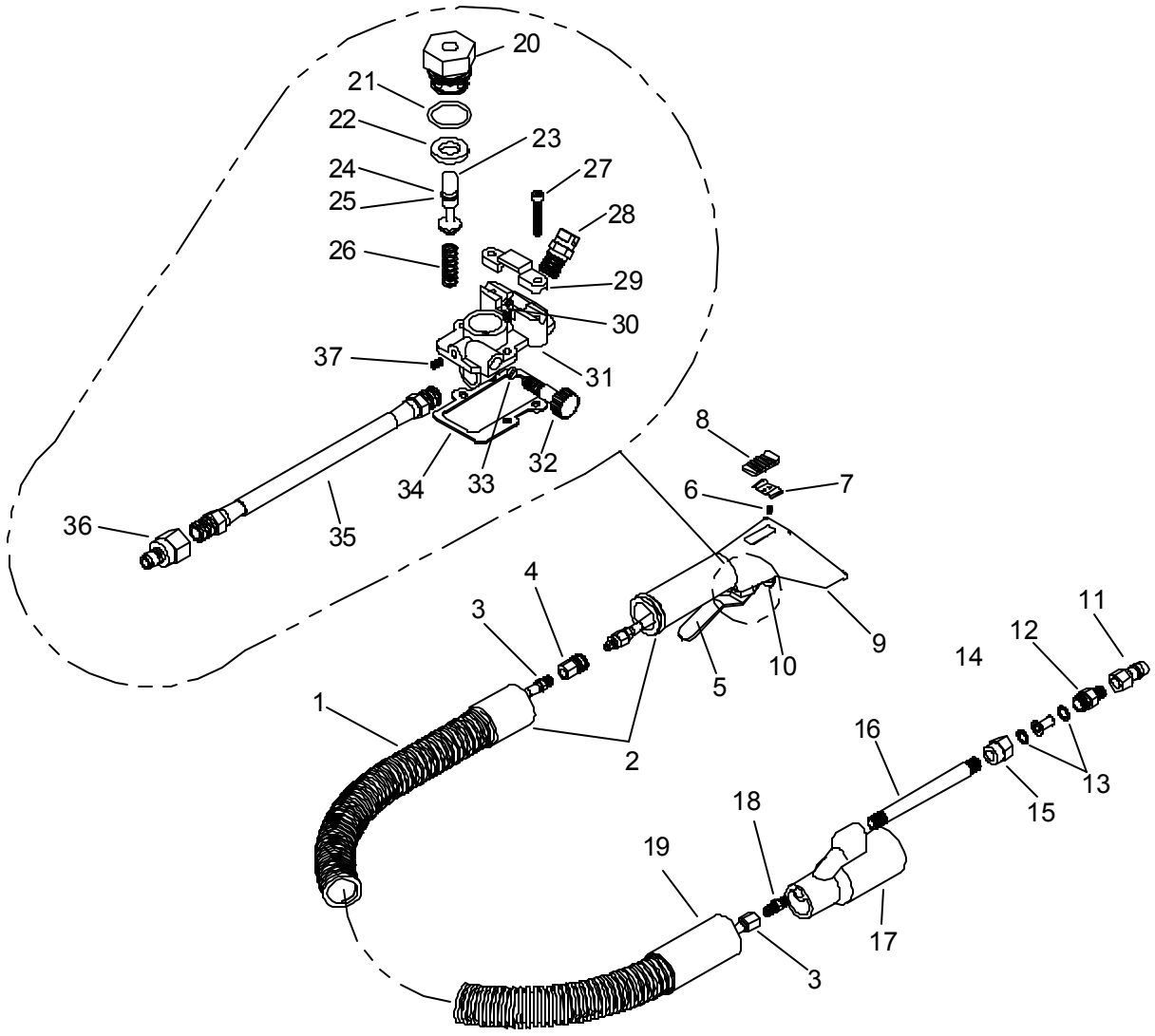
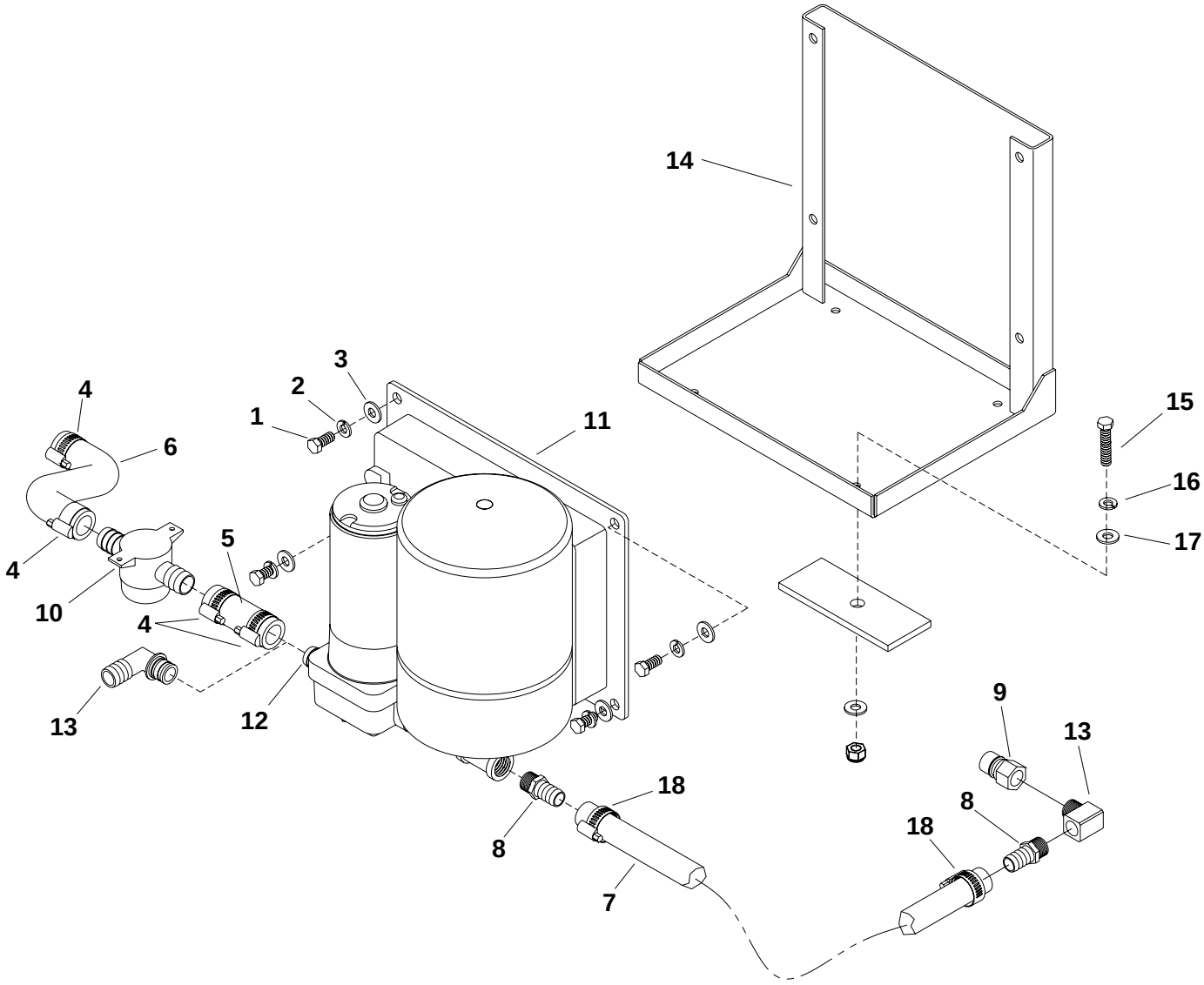
REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
-	78519	TL, STAIR, LNG, TM DJ (80015)		COMPLETE
-	78521	TL, STAIR, SHT, TM (80015)		COMPLETE
1A	56-501715	WAND & HEAD, STAIR TL		
1B	56-501907	WAND & HEAD, SHRT STAIR TL		
2	52-501576	BODY, WD HDL PORT		
3	52-501577	HOLD DOWN, WD HDL PORT		
4	04-000053	TIE, CABLE 8” WHT		
5A	10-805330	HOSE, 3/16X13-3/4 (1/8PX1/4)		
5B	10-805397	HOSE, 3/16X7-1/2 (1/8P X 1/4F)		
6	17-803002	TIP, SPRY 9502X1/8P SST		
7	00-000282	SCR, CAP 1/4-20 X 1-1/4 SOC		
8	12-800060	CONN, 1/4P X 1/4T BR		
9	00-000317	SCR, CAP 10-32X1-1/4 SOCH		
10	57090	NUT, 10-32 HEX NYLOCK SS		
11	61-950496	ASSY, EXTRCTR VLV		
12	56015	NIPPLE, 1/4 HEX		
13	56012	NIPPLE, 1/4 FPT QD		
14	52-501619	TRIGGER, WD VLV		
15A	09-805359	SLEEVE, WD HDL 9.5		
15B	09-805504	SLEEVE, STAIR TL HDL 7-1/8		
16	16-808229	HOLDER, VLV STEM-EXTRCTR VL		
17	43-810063	O-RING, .551 ID .691 OD		
18	16-808228	SEAT, EXTRCTR VLV		
19	16-808189	STEM, EXTRCTR VLV		
20	43-810064	BACK-UP, .250DIA		
21	43-810062	O-RING, .114 ID .254 OD		
22	16-808190	SPRING, EXTRCTR VLV		
23	52-501590	BODY, EXTRCTR VLV		
-	48-941163	DECAL, STAIR TL		NOT SHOWN
-	66-808169	KIT, REP-WD VLV		NOT SHOWN INCLUDES PARTS 16-19 & 20-22

UPHOLSTERY TOOL

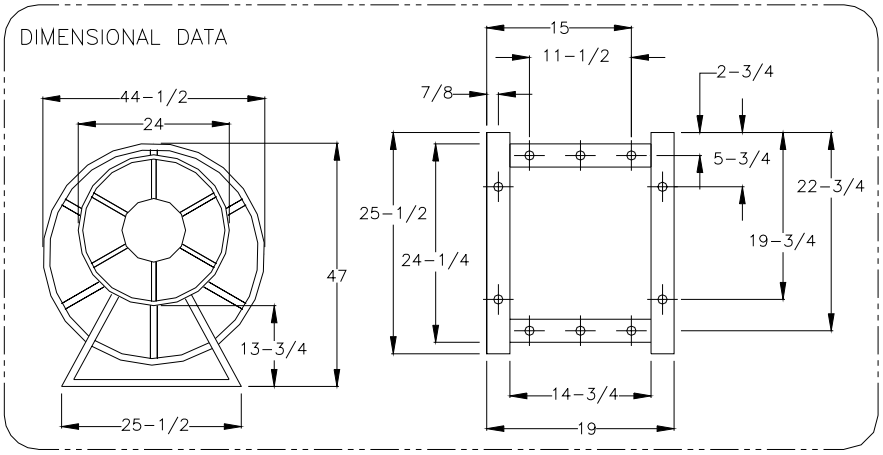


REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
-	78513	TL, UPHOST, PC (80015)		COMPLETE
1	09-805131	HOSE, VAC 1-1/4X10' BLU		
2	08-805243	CUFF, SWIV 1-1/4HX1-1/4T		
3	10-805347	HOSE, 3/16X119-1/2 (1/8PX1/4FT)		
4	13-806023	DSC, 1/8FC1/8FP SST		
5	58-500639	UPHOLSTERY TL TRIGGER		
6	00-000310	SCR, CAP 4-40 X7/32 SHCS SS		
7	04-000282	SPRING, VAC ADJ BUTT		
8	52-501624	BUTTON, VAC ADJ		
9	52-501842	TOOL, UPHOLSTERY		
10	61-950570	ASSY, UPHLST TL VLV		INCLUDES PARTS 20-26, 28, & 31- 37
11	560012	NIPPLE, 1/4 NPT QD		
12	17-803010	CONN, 1/4P X 11/16-16M		
13	17-803006	WASHER, NYLON		
14	14-806512	STRAIRNER, JET 50MESH		
15	17-803036	CONN, 1/4FPX11/16-16F BR		
16	11-800404	NIP, 1/4X5 SST		
17	52-501585	COUPLER, UPHLST TL		
18	12-800065	CONN, 1/8P X 1/4T		
19	08-805138	CUFF, 1 1/4H X 1 1/2T GRY		
20	16-808229	HOLDER, VLV STEM-EXTRCTR VL		
21	43-810063	O-RING, .551 ID .691 OD		
22	16-808228	SEAT, EXTRCTR VLV		
23	16-808189	STEM, EXTRCTR VLV		
24	43-810064	BACK-UP, 250DIA		
25	43-810062	O-RING, .144 ID .254 OD		
26	16-808190	SPRING, EXTRCTR VLV		
27	00-000306	SCR, 6-32 X 1 SCHD SS		
28	17-803033	TIP, SPRY 80015X1/8P SST		
29	58-500638	CSTG, TRIGGER CLMP		
30	00-000307	SCR, CAP 6-32X3/8 SOCHD		
31	52-501623	VALVE, UPHLST TL		
32	52-501626	VALVE, ADJ-UPHLST TL VLV		
33	43-810016	O-RING, 5/32IDX9/32OD VIT		
34	43-807513	GASKET, UPHLST TL VLV		
35	10-805348	HOSE, 3/16X6-1/2 (1/8P BS)		
36	13-806030	DSC, 1/8MX1/8FP SST		
37	00-000408	SCR, SET 3-32 X 1/4 SOCHD		
-	48-941164	DECAL, UPHLST TL		NOT SHOWN
-	66-808169	KIT, REPAIR-WAND VLV		NOT SHOWN INCLUDES PARTS 20-22 & 24-26

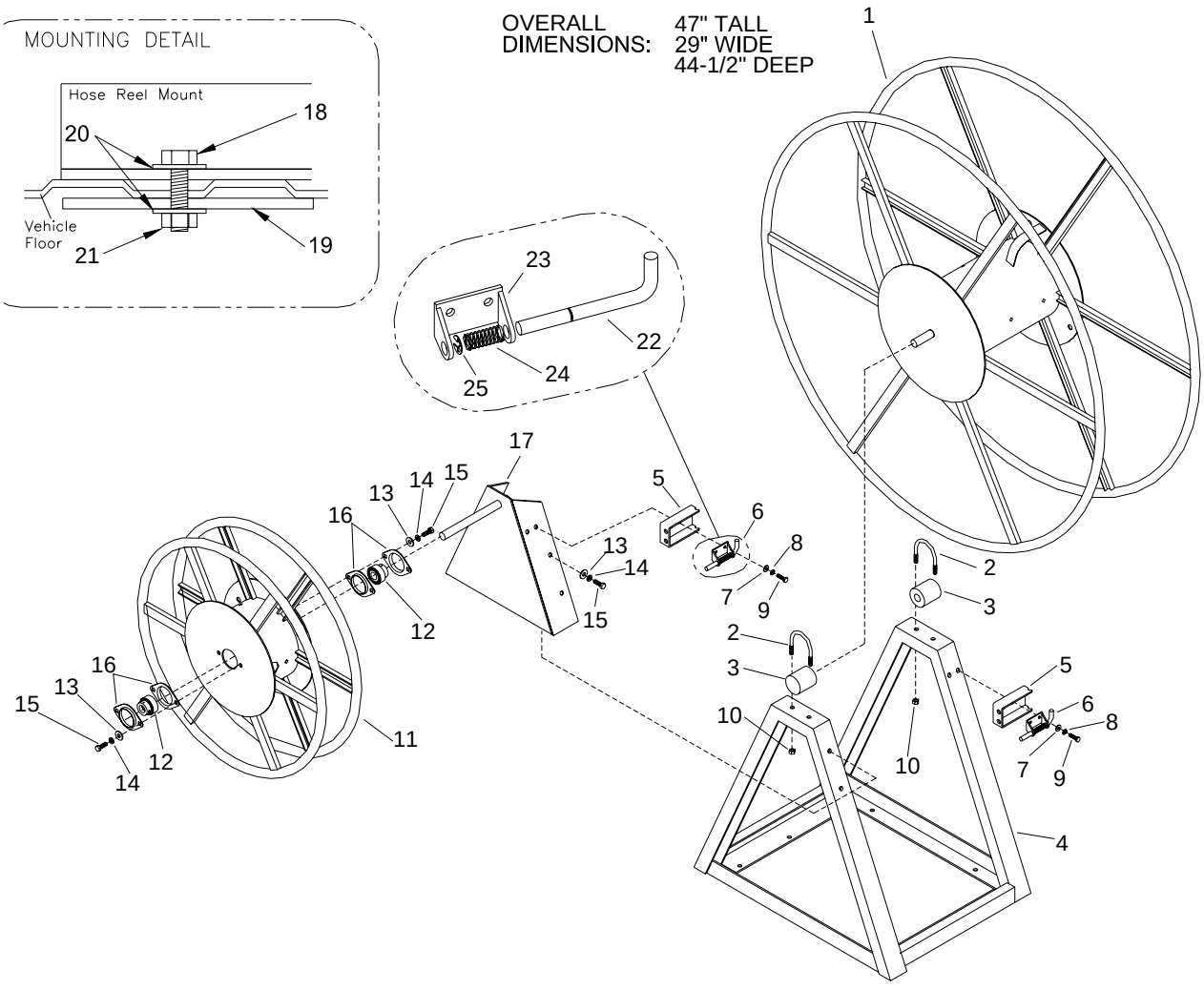
DEMAND PUMP



REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
1	70305	SCR, 5/16-18 X 3/4 HHCS GR5 PL TDL		
2	87083	WASHER, 5/16 SPLIT LOCK PLTD		
3	02-000143	WASHER, 5/16 FLAT		
4	03-000113	CLAMP, HOSE #12 SST		
5	09-805278	HOSE, WATER 3/4 X 3”		
6	09-805357	HOSE, WATER .75 X 5.5		
7	09-805446	HOSE, WATE 5/8 X 55		
8	12-800345	FTTG, BRB 3/8P X 5/8H BR		
9	13-806009	DISCONNECT, 3/8M X 3/8FP		
10	14-806553	FILTER, DEMAND PUMP		
11	41-905049	PUMP, WATER BOOSTER FLOJET 2		
12	20381-022	KIT, PORT		
13	11-800275	ELBOW, ST 3/8 BR		
14	56-502552	BRKT, DEMAND PUMP		
15	00-000072	SCR, 3/8-16 X 2” HXHD		
16	87171	WASHER, 3/8 FLAT		
17	02-000143	WASHER, 5/16 FLAT PLTD		
18	03-000246	CLAMP, HOSE #8 SST		

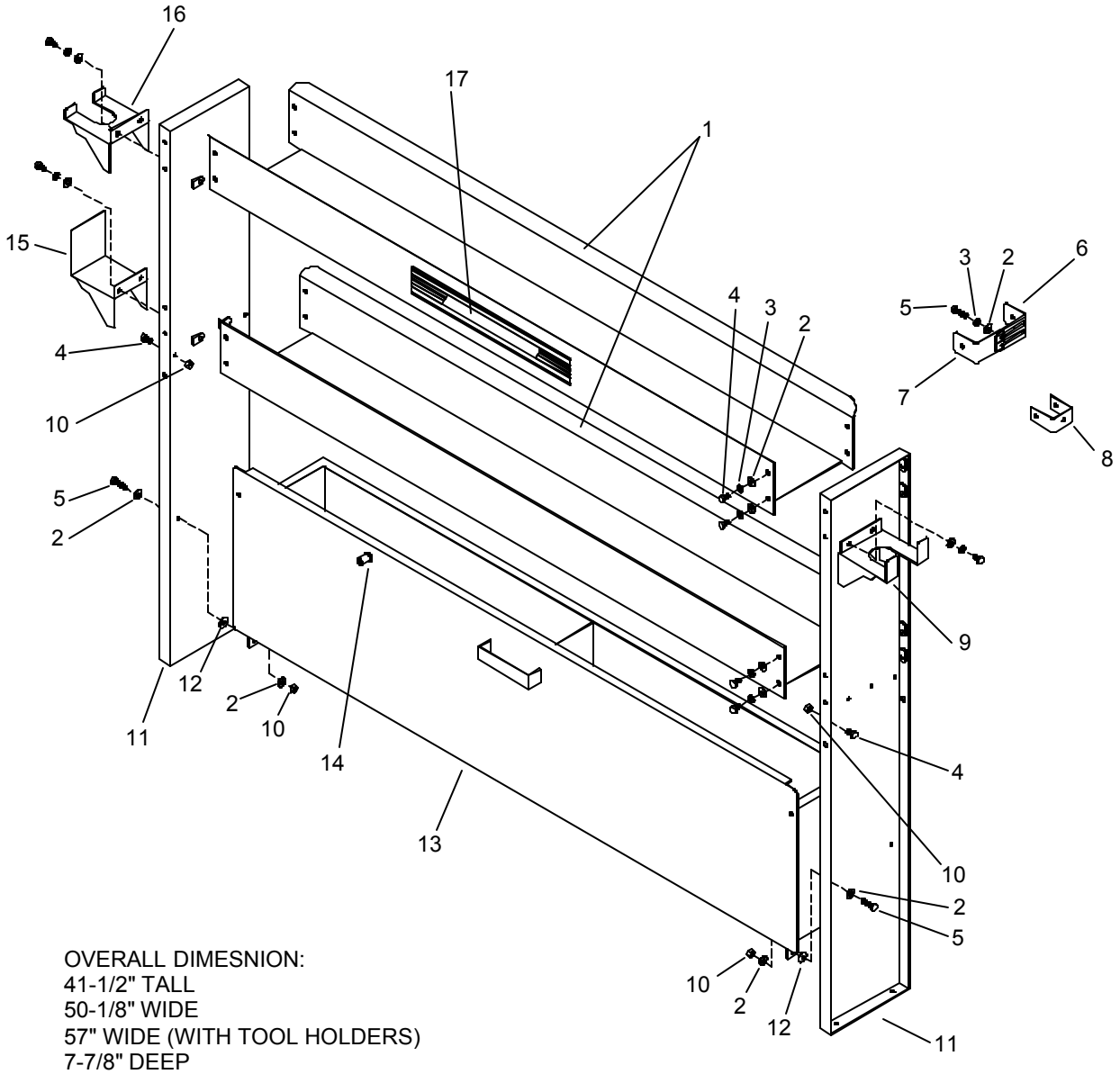


OVERALL DIMENSIONS: 47" TALL
29" WIDE
44-1/2" DEEP

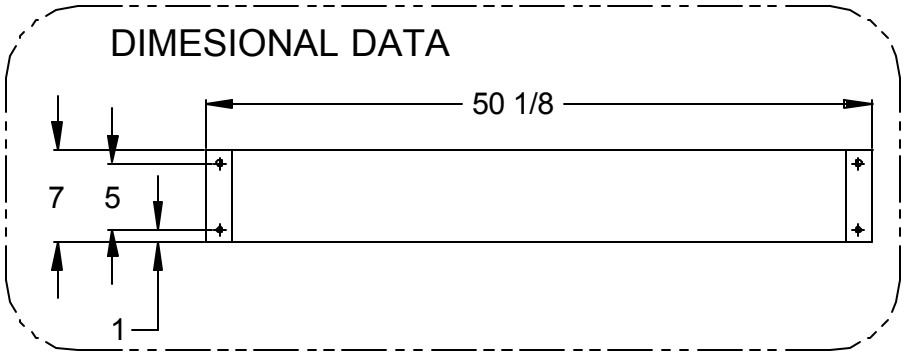


REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
-	65-950393	HOSE REEL, HIGH PROFILE PC		
1	56-501962	REEL, VACUUM HOSE GRAY		
2	03-000124	CLAMP, MFLR 1-3/4		
3	52-501685	BUSHING, HOSE REEL		
4	56-501960	BASE, HOSE RL (250')		
5	56-502207	BRKT, LOCKOUT HOSE REEL		
6	61-950854	LATCH ASSEMBLY		
7	02-000066	FLATWASHER, 1/4		
8	87162	WASHER, 1/4 SLPIT LOCK		
9	70270	SCR, 1/4-20 X 3/4 HHCS PLTD		
10	57031	NUT, 5/16-18 HEX		
11	56-501968	REEL, HP HOSE GRAY		
12	45-802138	BEARING HOSE REEL		
13	02-000143	FLATWASHER, 5/16		
14	87083	WASHER, 5/16 SPLIT LOCK PLTD		
15	70302	SCR, 5/16-18 X 1" HHCSGR5PLT		
16	44-802122	FLANGE, 47MST		
17	56-501961	BODY, HP HOSE GRAY		
18	00-000072	SCR, 3/8-16 X 2" HXHD		
19	50-500511	PLATE, INSTALL MT		
20	87171	WASHER, 3/8 FLAT		
21	57119	NUT, 3/8-16 HEX NYLOCK		
22	55-501789	PIN, LOCK HOSE REEL		
23	50-501812	BRKT, HOSE REEL LOCK		
24	04-000302	SPRING, LOCK-LOCK PIN ASSY		
25	04-000303	CLIP, RETAINER-LOCK PIN ASSY		

SHELF ASSEMBLY

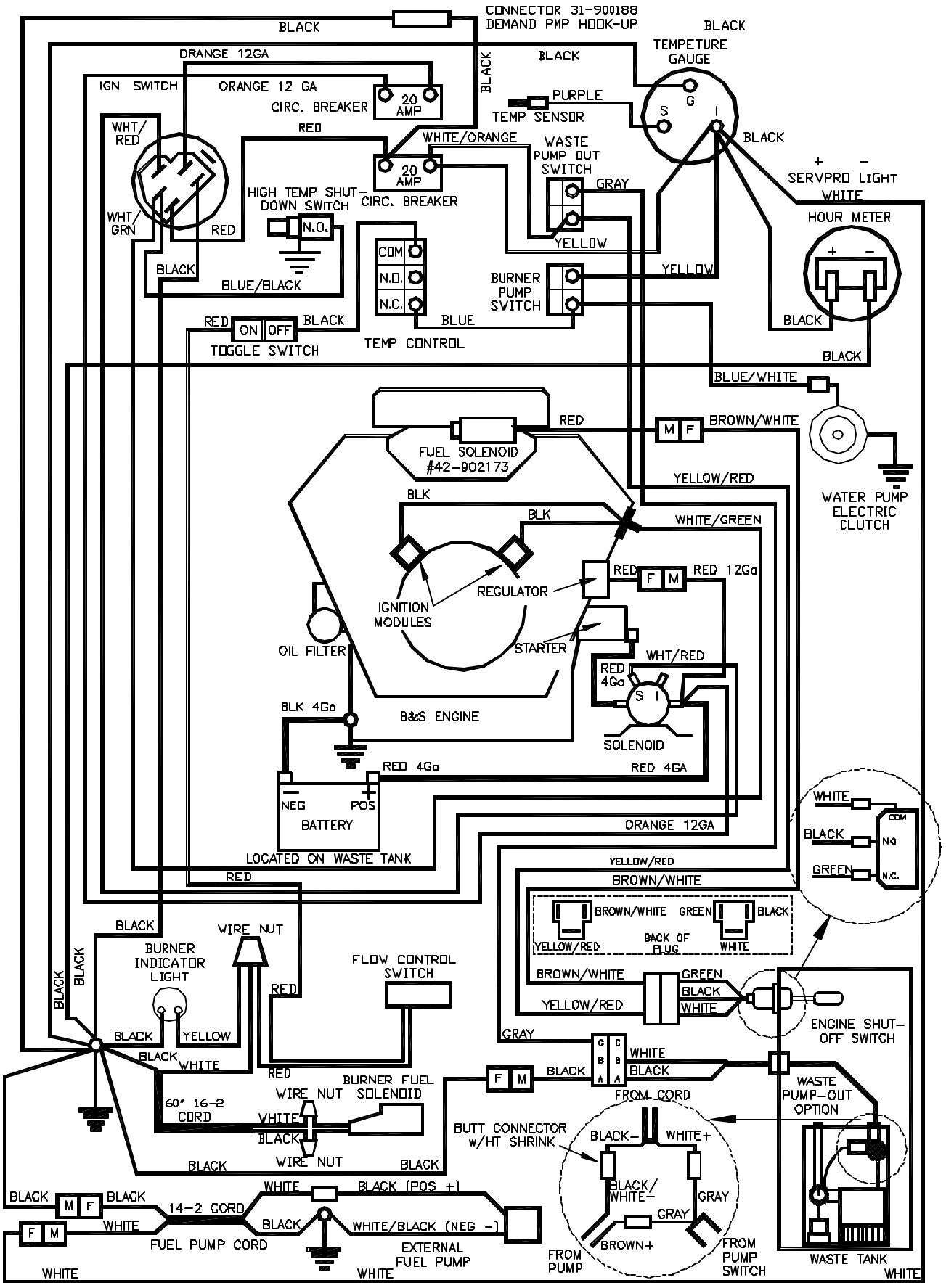


OVERALL DIMESNION:
41-1/2" TALL
50-1/8" WIDE
57" WIDE (WITH TOOL HOLDERS)
7-7/8" DEEP



REF	PART NO.	DESCRIPTION	SERIAL NO. FROM	NOTES:
-	65-950392	VAN STORAGE UNIT		
1	56-501921	SHELF, LWR		
2	02-000066	FLATWASHER, 1/4		
3	87162	WASHER, 1/4 SPLIT LOCK		
4	70721	SHOULDER BOLT, 182 OD X 2.25 L		
5	70270	SCR, 1/4-20 X 3/4 HHCS PLTD		
6	50-501840	BRKT, ADJUST MTG SLOT		
7	56-502067	BRKT, ADJUST MTF HLDR		
8	56-501942	BRKT, SHELF MOUNTING		
9	50-501753	HOLDER, STAIR TOOL		
10	01-000105	LOCK NUT, 1/4-20 HXHD		
11	56-501922	PANEL, SHLF END		
12	50-501749	WASHER, NYLON		
13	56-501920	DRAWER, SHELF GRAY		
14	46-802506	LATCH, ADJ GRIP		
15	50-501755	HOLDER, UP TO HOSE		
16	50-501754	HOLDER, UPHST TL		
17	48-941152	DECAL, PROCHEM		
-	66-945424	KIT, ADJ BRKT.		INCLUDES PARTS 6,7 & MOUNTING HARDWARE

WIRING DIAGRAM



New Truck Mount Machine Warranty

Limited Warranty

PROCHEM warrants new machines against defects in material and workmanship under normal use and service to the original purchaser. Any statutory implied warranties, including any warranty of merchantability or fitness for a particular purpose, are expressly limited to the duration of this written warranty. *PROCHEM* will not be liable for any other damages, including but not limited to indirect or special consequential damages arising out of or in connection with the furnishing, performance, use or inability to use the machine. This remedy shall be the exclusive remedy of the buyer. The warranty period is subject to the conditions stated below.
Any local or distant transportation, related service labor, normal maintenance, and diagnostic calls are not included.

Parts replaced or repaired under this warranty are guaranteed for the remainder of the original warranty period or 90 days.

Component	Coverage Responsibility	Length of Warranty
Gasoline Engine	**Engine Dependant:** **Briggs & Stratton – 1-800-233-3723** **Kohler – 1-800-655-4356** **Kubota-1-847-955-2500**	2 year
Gasoline Engine	**Engine Dependant:** **Nissan – 1-815-568-0061**	1 year
Vacuum Pump	PROCHEM	18 months
Engine Heat Exchanger	PROCHEM	1 year
Water Pump	PROCHEM	2 years
Waste Pump	PROCHEM	1 year
Wands(except shut off valve and jets)	PROCHEM	1 year
Waste and Water Tanks	PROCHEM	1 year
Pressure Regulator	PROCHEM	1 year
All other component not excluded below	PROCHEM	1 year
Trojan Battery	**Pro-rated through battery manufacturer's local dealer.** **1- 800-423-6569**	1 year

Product exceptions and Exclusions:

- Normal wear items and maintenance items including but not limited to disposable filters, any fluids, electrical components, belts, pulleys, bearings, fittings, hoses, o-rings, seals, gaskets, diaphragms, engine tune up components, wand shut off valve, and jets are covered**, parts only,** for 90 days**.**
- ***NOTE:*** Engine and battery warranties are administered through the manufacturer and must be repaired at an authorized service center.

PROCHEM. ● a Castle Rock Industries company ● 1351 W. Stanford Ave. ● (303) 762-1800 ● 800-444-7654 ● FAX (303) 865-2800

This Warranty Shall Not Apply To:

1. Any product that has been subject to abuse, misuse, neglect or unauthorized alteration (including the use of incompatible or corrosive chemicals or overloading of capacity).
2. Products that have experienced shipping or freight damage.
3. Repairs necessary to correct any failure due to improper pre-delivery service and inspection by the selling dealer.
4. Time for cleaning units in preparation for repair.
5. Any repairs resulting from poor initial service work or improper diagnosis.
6. Any design alterations performed by an organization not authorized or specified by PROCHEM.
7. A unit which is improperly repaired.
8. Damage due to hard water scaling.
9. Exposure to freezing temperature conditions.
10. Electrical components exposed to moisture.

The warranty commences on the purchase date by the original end user from an authorized *PROCHEM* agent, subject to proof of purchase. **The warranty is non transferable and is intended for the original purchaser only**. The Machine Registration Card must be completed and returned within 10 days of the purchase. If proof of purchase cannot be identified, the warranty start date is 90 days after the date of sale to an authorized *PROCHEM* distributor.

If difficulty develops during the warranty period, contact the authorized *PROCHEM* agent from whom the product was purchased. *PROCHEM* may elect to require the return of components to validate a claim. Any defective part to be returned must be shipped **freight prepaid** to an authorized *PROCHEM* Distributor/Service Center or to the *PROCHEM* factory.

Use Of Parts Not Approved By *PROCHEM* Will Void All Warranties.

PROCHEM. ● a Castle Rock Industries company ● 1351 W. Stanford Ave. ● (303) 762-1800 ● 800-444-7654 ● FAX (303) 865-2800